STANDARDS DEVELOPMENT BRANCH OMOE
36936000009062

THE
ONTARIO WATER RESOURCES COMMISSION

WATER RESOURCES SURVEY

COUNTY OF CARLETON

A SURVEY OF WATER RESOURCES
AND STREAM POLLUTION WITH
RECOMMENDED PROGRAMS

PART I

1960 to 1963

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

WATER RESOURCES SURVEY

County of Carleton

A survey of water resources
and stream pollution with
recommended programs.

PART I

Date
1960 to 1963

INDEX

TOPIC PAGE NO.

Index

List of Figures

List of Tables

Abbreviations

Appendices

PART I

CHAPTER I

Summary and Recommendations
Summary 1
Recommendations 3

1. City of Ottawa 3
2. City of Eastview 4
3. Village of Richmond 4
4. Village of Rockcliffe Park 4
5. Village of Stittsville 4
6. Townships

CHAPTER 2

Geography

1. Location 11
2. Topography and Drainage 11
3. Climate 12
4. Population 12
5. Industry 13
6. Agriculture 14

CHAPTER 3

I Geology 15

1. Bedrock Geology 15
2. Overburden Geology 15

II Ground Water 16

1. Occurrence 16
2. Source and Production 18

Page No.

3. Water Quality 19
4. Use 20
5. Ground Water Availability 21
6. Summary and Conclusions 22
7. Recommendations 22

CHAPTER 4

Surface Water

I General 32
II Watercourses 32

CHAPTER 5

National Capital Region

1. General 58
2. The Green Belt 58

CHAPTER 6

CITIES

City of Ottawa 59
I General 59
II Water Supply 59

1. Source 59
2. Water Purification Plants 60
3. Pumpage 60
4. Distribution 61

III Water Requirements for the Future 62
IV Water Pollution 62

1. Sanitary Waste Disposal 62
(a) Existing Conditions 62
(b) Proposed Sewage Works 63
2. Industrial Waste Disposal 65
3. Recreational Sites 65
4. Surface Water Quality 66

V Recommendations for Water Development 67
VI Recommendations for Pollution Control 68

City of Eastview
I General 69
II Water Supply 69
III Water Requirements for the Future 69

Page No.

IV Water Pollution 69

  1. Sanitary Waste Disposal 69
  2. Industrial Waste Disposal 69
  3. Surface Water Quality 70

V Recommendations for Water Development 70
VI Recommendations for Pollution Control 70

CHAPTER 7

Villages

Village of Richmond 77

I General 77
II Water Supply 77
III Water Requirements for the Future 77
IV Water Pollution 78

  1. Sanitary Waste Disposal 78
  2. Industrial Waste Disposal 78
  3. Surface Water Quality 78

V Recommendations for Water Development 79
VI Recommendations for Pollution Control 79

Village of Rockcliffe Park 81

I General 81
II Water Supply 81

  1. Source 81
  2. Distribution 81

III Water Requirements for the Future 81

IV Water Pollution 81

  1. Sanitary Waste Disposal 81
  2. Industrial Waste Disposal 82
  3. Surface Water Quality 82

V Recommendations for Water Development 82
VI Recommendations for Pollution Control 82

Page No.

Village of Stittsville 83

I General 83
II Water Supply 83
III Water Requirements for the Future 83
IV Water Pollution 85

    1. Sanitary Waste Disposal 85
    2. Industrial Waste Disposal 85
    3. Surface Water Quality 85

V Recommendations for Water Development 85
VI Recommendations for Pollution Control 86

CHAPTER 8

Township of Fitzroy 87

I General 87
II Water Supply 88
III Water Requirements for the Future 88
IV Water Pollution 88

    1. Sanitary Waste Disposal 88
    2. Industrial Waste Disposal 88
    3. Surface Water Quality 89

V Recommendations for Water Development 90
VI Recommendations for Pollution Control 90

Township of Gloucester 93

I General 93
II Water Supply 93
III Water Requirements for the Future 94
IV Water Pollution 96

    1. Sanitary Waste Disposal 96
        (a) Existing Sewage Works 96
        (b) Future Sewage Works 97
    2. Industrial Waste Disposal 98
    3. Surface Water Quality 99

V Recommendations for Water Development 100
VI Recommendations for Pollution Control 101

Police Village of Orleans 101

Page No.

Township of Goulbourn 107

I General 107
II Water Supply 107
III Water Requirements for the Future 107
IV Water Pollution 108

  1. Sanitary Waste Disposal 108
    (a) Existing Conditions 108
    (b) Future Sewage Works 108
  2. Industrial Waste Disposal 108
  3. Surface Water Quality 108

V Recommendations for Water Development 109
VI Recommendations for Pollution Control 109

Township of North Gower 111

I General 111
II Water Supply 111
III Water Pollution 112

  1. Sanitary Waste Disposal 112
  2. Industrial Waste Disposal 112
  3. Surface Water Quality 112

V Recommendations for Water Development 113
VI Recommendations for Pollution Control 113

Police Village of Manotick 113

Police Village of North Gower 114

Township of Huntley 116

I General 116
II Water Supply 116
III Water Requirements for the Future 117
IV Water Pollution 117

  1. Sanitary Waste Disposal 117
  2. Surface Water Quality 117

V Recommendations for Water Development 118
VI Recommendations for Pollution Control 118

Page No.

Township of March 121

I General 121
II Water Supply 121
III Water Requirements for the Future 121
IV Water Pollution 122

1. Sanitary Waste Disposal 122
2. Industrial Waste Disposal 122
3. Surface Water Quality 122

V Recommendations for Water Development 123
VI Recommendations for Pollution Control 123

Township of Marlborough 125

I General 125
II Water Supply 125
III Water Requirements for the Future 125
IV Water Pollution 126

1. Sanitary Waste Disposal 126
2. Industrial Waste Disposal 126
3. Surface Water Quality 126

V Recommendations for Water Development 127
VI Recommendations for Pollution Control 127

Township of Nepean 129

I General 129
II Water Supply 129
III Water Requirements for the Future 130
IV Water Pollution 131

1. Sanitary Waste Disposal 131
2. Industrial Waste Disposal 132
3. Surface Water Quality 132

V Recommendations for Water Development 135
VI Recommendations for Pollution Control 136

Police Village of City View

Page No.

Township of Osgoode 141

I General 141
II Water Supply 141
III Water Requirements for the Future 142
IV Water Pollution 142

1. Sanitary Waste Disposal 142
2. Industrial Waste Disposal 142
3. Surface Water Quality 143

V Recommendations for Water Development 143
VI Recommendations for Pollution Control 144

Police Village of Kenmore 144

Police Village of Metcalfe 144

Police Village of Osgoode 145

Township of Torbolton 148

I General 148
II Water Supply 148
III Water Requirements for the Future 148
IV Water Pollution 149

1. Sanitary Waste Disposal 149
2. Industrial Waste Disposal 149
3. Surface Water Quality 149

V Recommendations for Water Development 149
VI Recommendations for Pollution Control 150

- FIGURES -

1. Map of Carleton County showing Bedrock Geology and the High Capacity Wells in the Bedrock
2. Map of Carleton County showing Overburden Geology and the Location of High Capacity Wells in the Overburden
3. Map of Carleton County showing Stream Sampling Points, Watershed Boundaries and Drainage Areas

- TABLES -

		Page No.
1a	Data for High Capacity Wells	23
1b	Ground Water Quality	29
2	Analyses of Stream Samples	41

- APPENDICES -

Appendix A	Interpretation of Analyses
Appendix B	Surface Water Quality Objectives

ABBREVIATIONS

BOD	Biochemical Oxygen Demand
ml.	millilitres
ppm.	parts per million
ppb.	parts per billion
gpm	gallons per minute
gpd	gallons per day
cfs.	cubic feet per second
W.P.C.P.	Water Pollution Control Plant
S.T.P.	Sewage Treatment Plant
OWRC	Ontario Water Resources Commission

WATER RESOURCES SURVEY

- County of Carleton -

CHAPTER I

SUMMARY AND RECOMMENDATIONS

SUMMARY

A survey of water resources and stream pollution in the County of Carleton was performed by Ontario Water Resources Commission staff. The initial investigations pertaining to this survey were conducted during 1960. Subsequent investigations and enquiries have been made since that time in conjunction with routine work in the area. Ground water resources and surface water quality were reviewed recently during the period of May 27 to 31, 1963.

Spectacular urban development has been experienced in Ottawa during the past decade and has extended into the townships lying adjacent to the city. Associated with such development is the need for adequate treatment of sanitary and industrial wastes, the provision of adequate water supplies where required, and the protection of the quality of all surface and ground waters.

Chapter 2 describes the geographical features of Carleton County. Geology and the various aspects of ground and surface waters are discussed on a county basis in Chapters 3 and 4, respectively. Pertinent aspects of ground and surface waters are discussed in more detail on a municipal basis in subsequent chapters wherein recommendations are made with respect to future water development and pollution control. Industrial waste disposal procedures are reported in Part II of this report.

The results of this survey can be summarized as follows:

1. Municipal water works systems serve more than 80 per cent of the population in Carleton County. The greatest concentration of population occurs in and near the City of Ottawa where surface water is the source of water supply for the Capital City and all or parts of adjacent municipalities. Numerous satellite areas near the Dominion Capital are served by municipal water works systems employing ground water supplies.

Most parts of Carleton County are able to obtain sufficient supplies of potable ground water from dug, drilled, and driven wells for domestic and commercial purposes. There are, however, a few areas where the water produced may be salty or sulphurous. Some areas will not support high capacity wells.

2. Water pollution in the county is associated with concentrations of population. The comprehensive sewage works construction program which is in progress at the City of Ottawa is a major step in combatting stream pollution. Where residential developments have occurred or are imminent in the Townships of March, Goulbourn and Nepean, attempts have been made to promote joint sewage works projects. A sewage works project has been proposed in Gloucester Township to serve parts of that municipality as well as parts of Nepean, Osgoode and North Gower Townships. The installation of private sewage disposal systems in municipalities included in the Gloucester-Nepean Health Unit is actively controlled by the health unit staff.

RECOMMENDATIONS

A critical review of the present and future water needs in Carleton County should be made prior to additional development and urbanization. Consideration should be given to the development and use of the available ground-water supplies. To do this, careful ground-water surveys and test-drilling programs should be undertaken. In all areas where ground water is used, the quality of ground water should be protected by the adequate supervision of waste disposal.

Action to control the pollution of surface water is essential.

The following recommendations are made with respect to water supplies and pollution control:

(1) City of Ottawa

(a) The present capacity of Ottawa's water purification works and the adequate source of surface water supply appear to preclude the necessity for recommendations at this time.

(b) In conjunction with the completion of Ottawa's sewage works construction program, action should be taken to ensure that all contaminated flows will be excluded from the watercourses and discharged to the municipal sanitary sewer system.

Industrial waste flows, if not acceptable to the municipal sanitary sewer system, should receive adequate treatment prior to discharge to a watercourse.

Sewage treatment processes at the Carleton Heights S.T.P. and the R.C.A.F. Uplands S.T.P. should be closely supervised.

(2) City of Eastview and Village of Rockcliffe Park

(a) No recommendations are made with respect to these municipalities which receive water supplies from the City of Ottawa distribution system.

(b) All contaminated flows should be excluded from surface waters.

(3) Village of Richmond

(a) The use of private wells should be continued. A test-drilling program should precede the future development of a communal water supply system if such should be considered.

(b) Efficient operation of the sewage treatment plant serving the South Carleton District High School is necessary.

(4) Village of Stittsville

(a) A test-drilling program should precede the development of any municipal water supply.

(b) The provision of separate sewage works for Stittsville should not be considered since the only receiving stream in the area is a small tributary of the Carp River and sufficient dilution would not be afforded by this small watercourse. The sewage works program for the proposed urban development in the north-east corner of Goulbourn Township should provide capacity to include the sewage flow from Stittsville.

(5) Township of Fitzroy

(a) Ground water should continue to be used as the source of water supply for domestic purposes. Detailed ground water surveys and test-drilling programs should be undertaken to establish the quantity of water available in any areas where subdivision or commercial developments are considered in the future. Drilling to depths greater than 60 feet into the limestones of the Ottawa formation is not recommended because of the risk of encountering salty or sulphurous water.

(b) Adequate methods of industrial waste disposal should be adopted at the Fitzroy Harbour Cheese Factory and the Kinburn Cheese Factory in order to exclude the plant wastes from the Carp River.

(6) Township of Gloucester

(a) Water from the City of Ottawa should be used to supply the water needs of the inner urban area. Careful consideration should be given to the establishment of an adequate water supply for present or future requirements within the Green Belt. If ground water is to be sought as the source of supply, ground-water surveys and test-drilling programs will be necessary to determine the quality and quantity of the ground-water supplies to be used for any proposed commercial or subdivision development.

(b) Effective supervision of the H.M.C.S. Gloucester S.T.P. should be maintained.

(7) Township of Goulbourn

(a) If ground water is to be used as the source of water supply for communal systems, surveys and test-drilling programs should be undertaken. It appears likely that sufficient ground-water supplies will be available, especially in areas where the Nepean sandstone formation is present at or near the bedrock surface.

(b) Sewage works for the township should be a joint program with March and Nepean Townships. Sewerage for the north-eastern part of the municipality should include provision, with respect to capacity, for serving the Village of Stittsville.

(8) Township of North Gower

(a) Ground-water supplies should be developed as far as possible to satisfy any future growth. Ground-water surveys and test-drilling programs should be undertaken to establish sources of water for any proposed communal distribution systems.

(b) Extensive development should not be considered in this township unless it is planned in conjunction with

Gloucester-Nepean sewerage proposals. Such planning would restrict development to the north-eastern part of the municipality.

(9) Township of Huntley

(a) Ground water should be used for future water supply requirements. Consideration should be given to the establishment of a communal water distribution system for the Carp area using ground water as the source of supply. Until an adequate water supply is available to the community, the extent and cause of any existing well contamination should be determined.

(b) The treatment efficiency of the sewage lagoon which serves the Emergency Measures Organization Centre near Carp should be reviewed.

(10) Township of March

(a) If any concentrated growth is anticipated for the township, a program of test-drilling should be undertaken in the areas under consideration to determine if ground water can adequately supply the developments. Deep drilling into the Ottawa limestone formation is not recommended.

(b) Any sewage works proposed for the south-eastern portion of the municipality should be a joint project with the Townships of Nepean and Goulbourn.

(11) Township of Marlborough

(a) Since the overburden materials over most of the township are not suitable for obtaining adequate supplies of water from dug wells, drilled wells should be constructed to supply most water requirements.

(b) Effluent chlorination procedures at the Rideau Industrial Farm S.T.P. should be supervised closely.

Untreated industrial waste flows from the Green Valley Cheese Factory should be excluded from the Rideau River.

(12) Township of Nepean

(a) Ground water should be developed to its full extent in the inner urban area, the Green Belt area, and the area beyond the Green Belt. To make this possible, all parties concerned with the development of ground water in the township should be aware of the Ontario Water Resources Commission water permit legislation which is designed to lead to full and beneficial use of all water resources.

(b) The planning of sewage works in the western portion of the township should be undertaken in conjunction with plans for the adjacent sections of March and Goulbourn Townships.

Increased treatment facilities are necessary at the Nepean Township W.P.C.P. The construction of an adequate outfall sewer to the main channel of the Ottawa River should accompany any expansion program at this plant. The storm sewer construction program should proceed in order to eliminate the necessity for pumping untreated sewage flows to a small watercourse which extends to the Rideau River.

Effective effluent chlorination procedures should be ensured at the Carleton Lodge S.T.P.

(13) Township of Osgoode

(a) Any developments or areas contemplating the use of high capacity wells should undertake ground-water surveys and test-drilling to determine the amount and quality of ground water available.

(b) The industrial waste flows from Cochrane's Dairy should be excluded from the South Castor River.

The treatment efficiency of the H.M.C.S. Gloucester S.T.P. in Gloucester Township should be reviewed to ensure that the effluent flows will be adequately stabilized prior to their discharge to a tributary of the Castor River.

The Police Village of Manotick and the adjacent areas of Osgoode Township should be considered in the proposal to provide sanitary sewers in the Manotick area with a connection to the proposed sewage treatment plant on the Rideau River.

(14) Township of Torbolton

(a) Deep drilling for water supplies into the Ottawa formation generally should be avoided because of the risk of encountering salty water. Adequate supplies of potable water will likely be obtained locally from the overburden and from the Rockcliffe, Oxford, and Nepean formations.

(b) The protection of surface water quality along the township's extensive beaches is necessary.

WATER RESOURCES SURVEY

- County of Carleton -

CHAPTER 2

GEOGRAPHY

GEOGRAPHY

1. Location

Carleton County is situated in eastern Ontario and is bounded on the east by Russell County, on the west by Lanark County, and on the south by Grenville and Dundas Counties. On the north, the Ottawa River forms the boundary between the county and the Province of Quebec. The Rideau River forms the southern boundary from the west end of the county to the centre where it turns northward to cut the county into two segments and join the Ottawa River at the City of Ottawa. The county is composed of 10 townships; Fitzroy, Torbolton, Huntley, March, Goulbourn, Nepean, Marlborough, North Gower, Gloucester, and Osgoode.

2. Topography and Drainage

Surface features of Carleton County are predominantly flat plans of limestone, clay, and sand that are interrupted in places by swampy areas, kame moraines, small drumlins, or sand and gravel beaches and bars. The broad valley of the Ottawa River which forms the northern boundary of the county and the Rideau River valley that bisects the area from south to north add relief to the county. In the northern part of the county, west and south of the

Ottawa River, faulting has caused several deep depressions. One example of this is the broad valley west of Carp.

The surface elevation ranges from 150 feet to 500 feet and averages about 300 feet. The lowest elevations are found along the Ottawa River and the highest elevations in some hills in the extreme western part of the county in Huntley and Goulbourn Townships.

The drainage in the county is by two main streams, the Ottawa River flowing south and east into the St.Lawrence River and the Rideau River flowing north into the Ottawa River. Numerous smaller tributaries flow into these two main streams. Drainage is discussed in more detail under Chapter 3 on surface water.

3. Climate

The Carleton County area has a temperate climate with very cold, snowy winters and warm summers. Weather patterns change readily from time to time. The weather is somewhat similar to that found in most of southern Ontario but the effect of the Great Lakes is not so pronounced and the climate is slightly cooler.

The annual temperature has a range of $138^{o}F$(from- 38^{o} to 100^{o}) with a mean annual of 41.6^{o}.

The mean annual precipitation is about 35 inches.

4. Population

The population of the County of Carleton in 1961 was 332,772 persons. A population increase of 102,315 people over an

11-year period from 1950 to 1961 is indicative of the rapid expansion in the Ottawa area. The National Capital Commission contemplates a steady rapid increase in population for the future, especially in the satellite areas around Ottawa. Growth trends in the individual municipalities are discussed later.

5. Industry

Present industry in the county is generally confined to the immediate vicinity of Ottawa. Only a few smaller industries such as cheese factories, feed mills, and slaughter houses exist in the townships away from the capital. The National Capital Commission plan for the area will confine future industrial growth to planned belts around the capital.

Because of the location on the Ottawa River at the junction of the Gatineau River, the Ottawa area is suited for basic industry depending on forest products. The rivers are suitable for transportation, and inexpensive hydro-electric power is available. As early as 1800 a lumber industry was started in this area. In 1850 Mr.E.B.Eddy began producing matches, then expanded into the pulp and paper industry which is now the major industry in the area. After the pulp and paper industry was established, service industries producing equipment for pulp and paper mills moved into the area.

Since the establishment of the national capital in Ottawa, less emphasis has been placed on industrial expansion. Considering the size and population of the City of Ottawa, it is not a highly industrialized city. As Ottawa is the Dominion Capital, much of the city's industry services the Dominion Government in such fields as the printing of securities and office forms.

6. Agriculture

Agriculture in Carleton County is largely devoted to the dairy industry. Cultivated lands are used for growing grain and hay, and for pasture. "Production of cattle, hogs, poultry, cereal grains, and grass seed form the basis from which the farm income is derived".** Truck gardens are common in Gloucester Township near Ottawa.

** Soil Survey of Carleton County - Report #7, Ontario Soil Survey, 1944, Page 78.

WATER RESOURCES SURVEY

- County of Carleton -

CHAPTER 3

GEOLOGY AND GROUND WATER

I GEOLOGY

1. Bedrock Geology(Precambrian and Palaeozoic)

The bedrock of Carleton County consists mainly of flat-lying Palaeozoic sediments of limestone, dolomite, sandstone, and shale. In some parts of the northwestern section of the county, Precambrian granite and crystalline limestone occur locally.

In those parts of the county that border on the Ottawa River, post-Palaeozoic faulting has brought unconformable sequences of sediments into contact with one another and in a few places in Nepean and March Townships, into contact with Precambrian granites. An examination of the available geological information and of the logs of wells drilled in these areas reveals the complex bedrock configuration which is shown on Figure 1.

2. Overburden Geology (Pleistocene and Recent)

Glacial, glacio-lacustrine, glacio-fluvial, and marine deposits form the overburden in the area. Marine clays, silts, and sands deposited in the Champlain Sea have partially or completely covered most of the glacial deposits over much of the area. The tops of drumlins stick up out of the clay in parts of Osgoode and North Gower Townships.

Old shorelines and beaches formed by the Champlain Sea and the Ottawa Valley Spillway are represented by sand and gravel ridges in various places throughout the county. One of the most prominent of these ridges extends across part of Gloucester Township into Nepean Township, crossing the Rideau River near Black Rapids.

Drift thicknesses range from zero where bedrock is exposed at surface to 200 feet but generally the overburden is considerably less than 100 feet thick. Thicknesses greater than 100 feet are found in the old Ottawa River Valley and in the areas of drift-filled, buried valleys. Figure 2 shows the Pleistocene geology of the county.

II GROUND WATER

1. Occurrence

Ground water is water present below the top of the saturated zone in the subsurface. It occurs in permeable geological formations known as aquifers, that is, formations having structures that permit appreciable water to move through them under ordinary field conditions.

In Carleton County, the limestone and sandstones of Ordovician and Cambrian ages are the best rock aquifers. These rocks are commonly porous or fractured and jointed thus allowing the movement of water through them. In parts of Nepean Township where the Nepean sandstone is present, good quantities of water are produced from it. The March, Oxford, Rockcliffe, and St.Martins formations, consisting largely of limestone, also produce adequate ground water supplies over most of the county. Some limestone formations are generally poor aquifers over most of the county. The Ottawa formation is an example of this type of formation.

In some rock aquifers, enough water for domestic and commercial requirements is present but the quality is objectionable. Such is the case with the Carlsbad, Billings, and Russell shales in the areas north-east of the Gloucester Fault where these formations produce sulphurous water. The Ottawa formation is known to produce sulphurous and/or salty water.

Figure 1 shows the location of many of the high capacity wells constructed into the bedrock in the county. Table Ia gives the data for these wells.

Some of the best aquifers in the county are sand and gravel horizons in the overburden. An example of such an aquifer is the large sand plain which extends from Bells Corners in Nepean Township eastward across the Rideau River near Uplands Airport into Gloucester Township where it increases in lateral extent. Although all parts of this sand plain do not produce large quantities of water, the areas of it around Uplands Airport and Bells Corners make good aquifers.

Other overburden aquifers are the gravel lenses interbedded with clay deposits in the broad flat valley of the Ottawa River near Orleans. Often water produced from gravels underlying the clays has an objectionable salty quality.

Figure 2 shows the location of several high capacity wells constructed into these overburden formations. Table Ia gives the data for these wells.

2. Source and Production

Nearly all ground water has its origin as precipitation. Precipitation enters the ground water aquifers directly where the aquifers are exposed at surface and indirectly by infiltration through material overlying them. Ground water flows by gravity through interconnected pore spaces and fractures in the overburden and bedrock formations to places of natural discharge such as springs or surface water bodies.

Ground water is produced in Carleton County by means of dug, drilled, and driven wells. Some ground water comes from springs which are generally used for cattle-watering and not for domestic water supplies.

Most dug wells and some drilled wells are constructed to shallow depths in the overburden and generally produce water under water-table conditions; that is, the wells are constructed so that they intersect the ground-water table. The water level in these wells fluctuates as the level of the water table under seasonal variations. In the late summer and fall months when the water table is generally at its lowest level, many of the shallow dug wells are inadequate sources of supply. Dug wells extending into sands and gravels are generally more reliable sources of supply than those constructed into clay or till deposits.

Most drilled wells extend to considerable depths in the overburden or bedrock and produce water under artesian conditions; that is, the water level rises up in the well above the horizon where the water was first encountered. Drilled wells are less likely to be affected by annual seasonal variations of ground-water levels and are more reliable sources of supply. Many drilled wells in the county flow with yields up to 5 gpm. Two locations where there are large numbers of flowing wells are along the north-east side of the Gloucester Fault north of Leitrim and at Carlsbad Springs.

Many of the drilled wells are capable only of supplying enough water for domestic purposes but there are others, particularly in parts of Nepean Township, that supply industrial and subdivision demands.

Some driven wells, constructed by pounding or jetting sand points into the sandy overburden are in use for domestic supply purposes in the Police Village of Osgoode.

3. Water Quality

Some of the aquifers that have been mentioned do not produce potable water. Some shales and related limestones contain sulphurous water. Deep drilling into some limestone formations or drilling into gravel beds that underlie considerable thicknesses of marine clay may produce salty water. The following table shows the water quality that may be expected in the more important water-bearing formations:

Aquifer	Water Quality
Sand and Gravel	- Usually fresh. Often salty when overlain by considerable thicknesses of marine clay.
Carlsbad and Billings formation	- Usually sulphurous.
Ottawa formation	- Sometimes fresh but usually sulphurous. Can also be salty at depth.
Rockcliffe and St.Martins formations	- Usually fresh but may be sulphurous.
Oxford and March formations	- Often fresh but may be sulphurous.
Nepean formation	- Fresh
Precambrian	- Fresh when available.

It must be emphasized that ground-water quality is extremely variable. In addition, no appraisal has been made of the formations listed from the point of view of hardness or iron content. In general, most ground water is considered to be hard. Table Ib gives a summary of the chemical quality of ground water from various parts of the county. In most cases ground water is bacterially pure, however, there are cases reported where both dug and drilled wells are being polluted by surface water or septic tank effluents.

4. Use

Ground water in Carleton County is used mainly for domestic, industrial, and public-supply purposes. More details of the use are given under the sections on the individual municipalities.

5. Ground Water Availability

The availability of ground water in the county can be described readily under the headings Productive Areas and Problem Areas.

A. Productive Areas

There appears to be some areas in the county that will be capable of supporting municipal and industrial water-supply systems. Three such areas are:

(i) from the vicinity of Bells Corners in Nepean Township eastward to Bowesville in Gloucester Township where the overburden sands and gravels may form a good aquifer.

(ii) near Bells Corners and Hazeldean and to the north-west where the Nepean sandstone formation is the uppermost bedrock formation or is overlain by thin deposits of limestone.

(iii) near Manotick, Merivale, and Johnston Corners where productive zones occur in the March, Oxford, and Rockcliffe formations.

B. Problem Areas

There are some problem areas in the county where it is often difficult to obtain sufficient supplies of potable water. Two such areas are:

(i) north-east of the Gloucester Fault in Gloucester Township where the Carlsbad, Billings, and Eastview shale formations are the uppermost formations of the bedrock.

(ii) in the Orleans area at locations where the Ottawa limestone formation is the only aquifer present.

6. Summary and Conclusions

Generally, most parts of Carleton County are able to obtain sufficient supplies of potable ground water from dug, drilled, and driven wells for domestic and commercial purposes. There are, however, a few areas where the water produced may be salty or sulphurous. Some areas will not support high capacity wells.

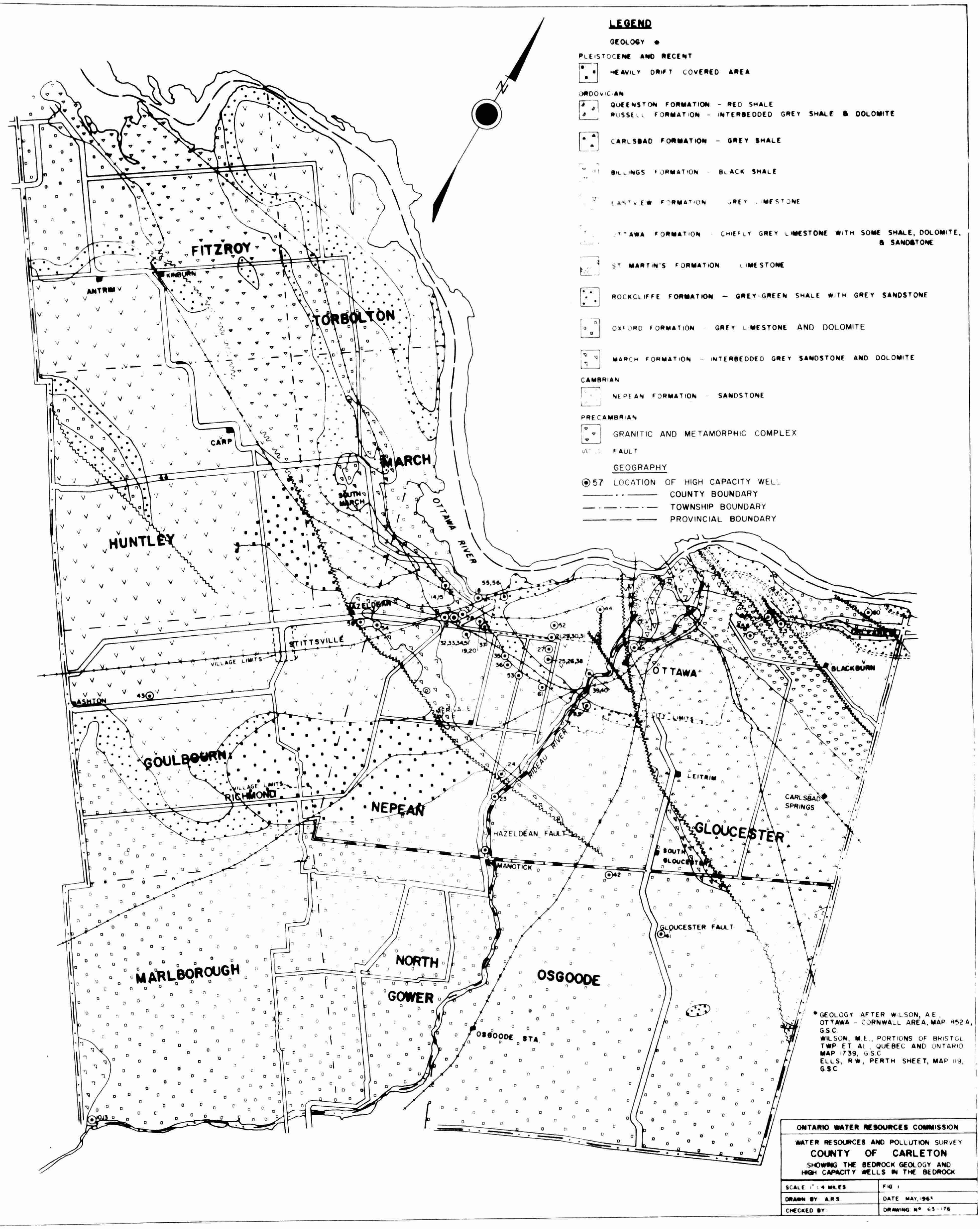
Shales and some limestones in the county are poor aquifers. Some sands and gravels in the overburden and some sandstones, limestones, and dolomites are the best aquifers. In all cases, these aquifers are supplied and recharged by precipitation and surface water.

7. Recommendations

Before more expansion takes place in Carleton County, a critical review of the present and future water needs should be made. Consideration should be given to the development and use of the available ground-water supplies. To do this, careful ground-water surveys and test-drilling programs should be undertaken.

In all areas where ground water is used, the quality of ground water should be protected by the adequate supervision of waste disposal.

Known areas of ground-water recharge such as cedar swamps closely overlying fractured bedrock at elevations higher than the surrounding country should be preserved.

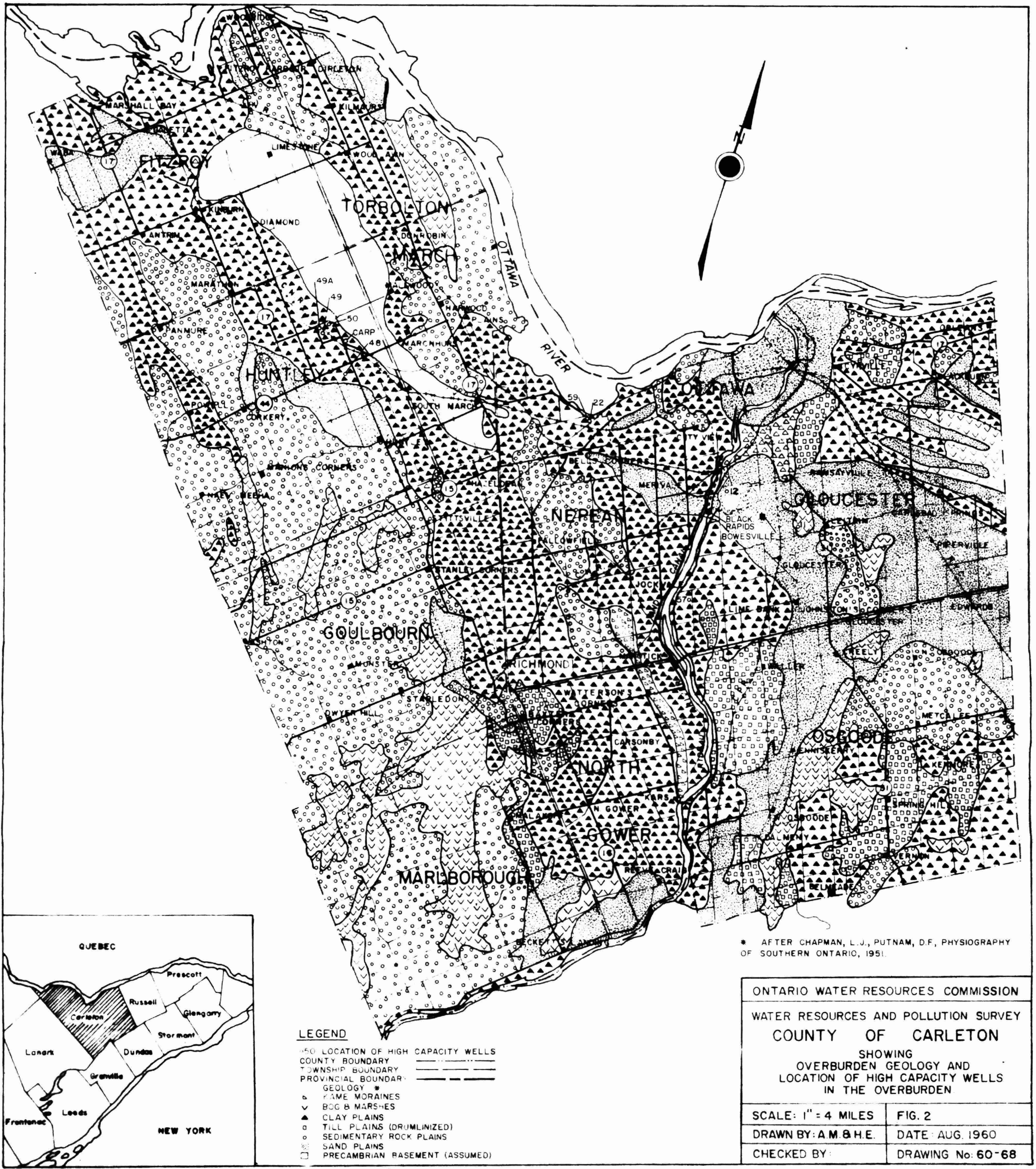

LEGEND
GEOLOGY *
PLEISTOCENE AND RECENT
HEAVILY DRIFT COVERED AREA
ORDOVICIAN
QUEENSTON FORMATION - RED SHALE
RUSSELL FORMATION - INTERBEDDED GREY SHALE & DOLOMITE
CARLSBAD FORMATION - GREY SHALE
BILLINGS FORMATION - BLACK SHALE
EASTVIEW FORMATION - GREY LIMESTONE
OTTAWA FORMATION - CHIEFLY GREY LIMESTONE WITH SOME SHALE, DOLOMITE, & SANDSTONE
ST MARTIN'S FORMATION - LIMESTONE
ROCKCLIFFE FORMATION — GREY-GREEN SHALE WITH GREY SANDSTONE
OXFORD FORMATION - GREY LIMESTONE AND DOLOMITE
MARCH FORMATION - INTERBEDDED GREY SANDSTONE AND DOLOMITE
CAMBRIAN
NEPEAN FORMATION - SANDSTONE
PRECAMBRIAN
GRANITIC AND METAMORPHIC COMPLEX
FAULT
GEOGRAPHY
⊙57 LOCATION OF HIGH CAPACITY WELL
COUNTY BOUNDARY
TOWNSHIP BOUNDARY
PROVINCIAL BOUNDARY
N
FITZROY
KINBURN
ANTRIM
TORBOLTON
CARP
MARCH
SOUTH MARCH
HUNTLEY
OTTAWA RIVER
55,56
8
14,15
44
52
21,29,30,31
HAZELDEAN
58
54
32,33,34,51
19,20
37
27
25,26,38
35
36
53
61
39,40
63
STITTSVILLE
VILLAGE LIMITS
43
ASHTON
OTTAWA
CITY LIMITS
60
BLACKBURN
GOULBOURN
VILLAGE LIMITS
RICHMOND
NEPEAN
RIDEAU RIVER
24
23
LEITRIM
CARLSBAD SPRINGS
GLOUCESTER
HAZELDEAN FAULT
SOUTH GLOUCESTER
MANOTICK
42
GLOUCESTER FAULT
41
MARLBOROUGH
NORTH GOWER
OSGOODE
OSGOODE STA.
13

* GEOLOGY AFTER WILSON, A.E., OTTAWA - CORNWALL AREA, MAP 852A, G.S.C.
WILSON, M.E., PORTIONS OF BRISTOL TWP ET AL, QUEBEC AND ONTARIO MAP 1739, G.S.C.
ELLS, R.W., PERTH SHEET, MAP 119, G.S.C.

ONTARIO WATER RESOURCES COMMISSION

WATER RESOURCES AND POLLUTION SURVEY
COUNTY OF CARLETON
SHOWING THE BEDROCK GEOLOGY AND HIGH CAPACITY WELLS IN THE BEDROCK

SCALE 1" : 4 MILES	FIG 1
DRAWN BY A.R.S.	DATE MAY, 1963
CHECKED BY:	DRAWING Nº 63-176



LEGEND

•50 LOCATION OF HIGH CAPACITY WELLS
COUNTY BOUNDARY —— · · —— · · ——
TOWNSHIP BOUNDARY —— —— ——
PROVINCIAL BOUNDARY ━━ ━ ━━

GEOLOGY *
- ▵ KAME MORAINES
- ⌄ BOG & MARSHES
- ▲ CLAY PLAINS
- ▫ TILL PLAINS (DRUMLINIZED)
- ○ SEDIMENTARY ROCK PLAINS
- ░ SAND PLAINS
- ☐ PRECAMBRIAN BASEMENT (ASSUMED)

* AFTER CHAPMAN, L.J., PUTNAM, D.F., PHYSIOGRAPHY OF SOUTHERN ONTARIO, 1951.

ONTARIO WATER RESOURCES COMMISSION

WATER RESOURCES AND POLLUTION SURVEY

COUNTY OF CARLETON

SHOWING
OVERBURDEN GEOLOGY AND
LOCATION OF HIGH CAPACITY WELLS
IN THE OVERBURDEN

SCALE: 1" = 4 MILES	FIG. 2
DRAWN BY: A.M. & H.E.	DATE AUG. 1960
CHECKED BY:	DRAWING No: 60-68

TABLE IA

DATA FOR HIGH CAPACITY WELLS

COUNTY OF CARLETON

WELL NO.	MUNICIPALITY	CON.	LOT	OWNER	DRILLED	WELL DIAM.	DEPTH	STATIC LEVEL M. OR R.	QUALITY	USE	QUANTITY	REMARKS: LOG, ETC.
1	GLOUCESTER TWP.	LONG ISLAND		HILLSIDE GARDENS G. MCLEAN	X	8	200	45	F	PS	92 GPM PL 130 48 HRS.	SAND AND BOULDERS 74; LIMESTONE 200
2	GLOUCESTER TWP.	1 OF	18	CARDINAL HEIGHTS L. GENDRON	X	6	325	86	F	PS	30 GPM PL 100 12 HRS.	CLAY 86; GRAVEL AND BOULDERS 106; SHALE 109; LIMESTONE 325
3	GLOUCESTER TWP.	1 OF	18	CARDINAL HEIGHTS L. GENDRON	X	6	325	85	F	PS	35 GPM PL 200 ½ HR.	CLAY 90; HARDPAN 138; LIMESTONE 325
4	GLOUCESTER TWP.	1 OF	20	CARDINAL HEIGHTS L. GENDRON	X	5	190	30	F	PS	7 GPM PL 60 2 HRS.	BOULDERS AND CLAY 4; LOOSE ROCK 7; LIMESTONE 190
5	GLOUCESTER TWP.	1 OF	20	CARDINAL HEIGHTS L. GENDRON	X	5	195	30	F	PS	7 GPM PL 60 2 HRS.	BOULDERS AND CLAY 7; SHALE 10; LIMESTONE 195
6	GLOUCESTER TWP.	1 OF	20	CARDINAL HEIGHTS L. GENDRON	X	6	316	30	F	PS	7 GPM PL 250 10 HRS.	BROKEN LIMESTONE 7; LIMESTONE 316
7	GLOUCESTER TWP.	11 OF	24	NORWOOD INTERESTS	X	8	120	FLOWS	F	PS	60 GPM PL 65 48 HRS.	CLAY 7; LIMESTONE 120
8	CITY OF OTTAWA			UPLANDS AIRPORT	X	10	370	36	F	PS	120 GPM PL 128 24 HRS.	SAND 33; CLAY AND GRAVEL 35; GRAVEL 73; CLAY AND GRAVEL 121; DOLOMITE AND SHALE 285; DOLOMITE AND LIMESTONE 335; SANDSTONE 370
9	CITY OF OTTAWA			UPLANDS AIRPORT	X	10	360	39	F	PS	175 GPM PL 145	INTO ROCK
10	MARLBOROUGH TWP.	1	30	INDUSTRIAL FARM	X	7	152	9	F	PS	60 GPM PL 100 12 HRS.	SOIL 2; SANDY CLAY 28; SANDSTONE 152

TABLE IA (CONT.)

WELL NO.	MUNICIPALITY	CON.	LOT	OWNER	DRILLED	WELL DIAM.	DEPTH	STATIC LEVEL M. OR R.	QUALITY	USE	QUANTITY	REMARKS: LOG, ETC.
11	GLOUCESTER TWP.	IVRF	13	CAPITAL GOLF GARDENS	X	10	44	13	F	IRR.	250 GPM PL 66 8 HRS.	MUCK 5; GRAVEL 44
12	CITY OF OTTAWA			UPLANDS AIRPORT	X	8	108	30	F	PS	319 GPM PL 48 24 HRS.	SAND 42; CLAY 51; GRAVEL AND BOULDERS 55; SAND 58; GRAVEL 72; SAND AND GRAVEL 84; COARSE GRAVEL 108
13	MARLBOROUGH TWP.	I	30	INDUSTRIAL FARM	X	7	147	TOP	F	PS	60 GPM PL 3 1 HR.	TOP SOIL 2; CLAY 53; SANDSTONE 147
14	NEPEAN TWP.	I OF	10	NORTHERN ELECTRIC	X	10	84	5	F	IND.	95 GPM PL 52 10 HRS.	CLAY AND BOULDERS 3; LIMESTONE 84
15	NEPEAN TWP.	I OF	10	NORTHERN ELECTRIC	X	10	200	8	F	IND.	125 GPM PL 42 48 HRS.	LOAM 4; LIMESTONE 167; SANDSTONE 200
16	NEPEAN TWP.	IIOF	11	BELLWOOD MOBILE	X	6	170	25	F	PS	100 GPM PL 100 48 HRS.	CLAY 28; SANDSTONE 170
17	NEPEAN TWP.	IIOF	12	ROBERTSON YATES	X	8	175	4	F	IND.	65 GPM PL 150 48 HRS.	CLAY 18; SANDSTONE 175
18	NEPEAN TWP.	IIOF	13	G. COOPER LAKEVIEW	X	6¼	275	12	F	PS	160 GPM PL 45 48 HRS.	CLAY 47; LIMESTONE 155; SANDSTONE 275
19	NEPEAN TWP.	IIOF	17	TERON CONSTRUCTION	X	6½	265	12	F	PS	172 GPM PL 49 48 HRS.	CLAY 9; SAND 75; FINE GRAVEL AND SAND 90; SAND 115; LIMESTONE 215; SANDSTONE 265
20	NEPEAN TWP.	II OF	17	TERON CONSTRUCTION	X	6¼	64	7	F	PS	30 GPM PL 35 48 HRS.	CLAY AND BOULDERS 22; SAND AND FINE GRAVEL 36; LIMESTONE 64
21	NEPEAN TWP.	ARF	33	NO. 1 PARKWOOD HILLS MINTO CONSTRUCTION	X	10	643	51	F	PS	75 GPM PL 220 48 HRS.	CLAY 70; HARDPAN 103; LIMESTONE 225; SHALE 275; LIMESTONE 540; SANDSTONE 643
22	NEPEAN TWP.	II OF	15	G. COOPER LAKEVIEW	X	6½	265	12	F	PS	200 GPM PL 26 48 HRS.	CLAY 40; SAND 60; GRAVEL 80
23	NEPEAN TWP.	I RF	10	HOME FOR THE AGED	X	13 8	298	8	F	PS	68 GPM PL 145 60 HRS.	CLAY, STONES AND BOULDERS 104; LIMESTONE 136; SANDSTONE 298

TABLE IA (CONT.)

WELL NO.	MUNICIPALITY	CON.	LOT	OWNER	DRILLED	WELL DIAM.	DEPTH	STATIC LEVEL M. OR R.	QUALITY	USE	QUANTITY	REMARKS: LOG, ETC.
24	NEPEAN TWP.	I RF	13	SHENKMAN PROPERTIES	X	10	167	4	F	PS	470 GPM PL 110 48 HRS.	CLAY 25; SAND 30; HARDPAN 51; GRAVEL SAND 57; LIMESTONE 130; NEPEAN SANDSTONE 167
25	NEPEAN TWP.	I RF	30	J.P. CHENIER	X	10	200	4	F	PS	25 GPM PL 160 6 HRS.	CLAY 14; SAND 32; LIMESTONE 195; SANDSTONE 200
26	NEPEAN TWP.	I RF	31	J.P. CHENIER	X	8	275	2	F	PS	50 GPM PL 250 48 HRS.	CLAY 30; SAND 32; LIMESTONE 215; SANDSTONE 260; GRANITE 275
27	NEPEAN TWP.	I RF	32	MEADOWLANDS DALE CONSTRUCTION	X	10	200	2	F	PS	425 GPM PL 105 72 HRS.	CLAY 32; BOULDERS 42; SAND 92; LIMESTONE 200
28	NEPEAN TWP.	II OF	13	COMP. DEVICES OF CANADA	X	6½	218	99	F	IND.	87 GPM PL 41 24 HRS.	BLUE CLAY 39; SANDSTONE 218
29	NEPEAN TWP.	ARF	33	NO. 2 PARKWOOD HILLS MINTO CONSTRUCTION	X	10	450	35	F	PS	100 GPM PL 180 48 HRS.	CLAY 60; TILL AND BOULDERS 100; GREY LIMESTONE 450
30	NEPEAN TWP.	ARF	33	NO. 4 PARKWOOD HILLS MINTO CONSTRUCTION	X	10	250	14	F	PS	132 GPM PL 73 48 HRS.	CLAY 40; TILL AND BOULDERS 85; LIMESTONE 250
31	NEPEAN TWP.	ARF	33	NO. 3 PARKWOOD HILLS MINTO CONSTRUCTION	X	10	450	41	F	PS	100 GPM PL 72 48 HRS.	BLUE CLAY 40; BOULDERY TILL 80; GREY LIMESTONE 450
32	NEPEAN TWP.	IVRF	35	LYONS DEVELOPMENT COMPANY	X	6	249	15	F	PS	50 GPM PL 165 40 HRS.	SAND AND CLAY; SANDSTONE 210; GRANITE 249
33	NEPEAN TWP.	IVRF	35	LYNHAR REALTY LYNWOOD NO. I	X	10	192	30	F	PS	150 GPM PL 90 48 HRS.	CLAY 62; SANDSTONE 192
34	NEPEAN TWP.	IVRF	35	LYNHAR REALTY LYNWOOD NO. I	X	10	200	36	F	PS	100 GPM PL 70 48 HRS.	CLAY 40; SILT 59; SANDSTONE 200
35	NEPEAN TWP.	IIRF	30	GREEN GLEN SUBDIVISION MANORDALE	X	10	197	24	F	PS	370 GPM PL 80 48 HRS.	SILT 16; GREY LIMESTONE 20; GREY LIMESTONE 75; NEPEAN SANDSTONE 185; GRANITE 197

TABLE IA (CONT.)

WELL NO.	MUNICIPALITY	CON.	LOT	OWNER	DRILLED	WELL DIAM.	DEPTH	STATIC LEVEL M. OR R.	QUALITY	USE	QUANTITY	REMARKS: LOG, ETC.
36	Nepean Twp.	IIRF	31	Dominion Building Materials	X	8	132	4	F	Ind.	50 GPM PL 7 48 HRS.	MUCK 2; SANDY CLAY 42; SAND 74; GREY LIMESTONE 130; SANDSTONE 132
37	Nepean Twp.	IIIRF	35	Allied Building Supply Company	X	8	150	38	F	Ind.	125 GPM PL 110 48 HRS.	CLAY 52; LIMESTONE 150
38	Nepean Twp.	I RF	31	Crestview Clark Farm	X	10	207		F	PS	400 GPM PL 60	INTO ROCK
39	City of Ottawa			Carleton Heights VLA	X	8	290	40	F	PS	75 GPM PL 66	INTO ROCK
40	City of Ottawa			Carleton Heights VLA	X				JV	PS	30 GPM	INTO ROCK
41	Osgoode Twp.	VI	10	R. Berthiaume	X	6	160	Flows	F	PS	300 GPM PL 25 24 HRS.	GREY LIMESTONE 147; SANDSTONE 160
42	Osgoode Twp.	IV	I	G. Stalkes	X	5	57	2	F	PS	116 GPM PL 15 4½ HRS.	SANDY CLAY 51; LIMESTONE 57
43	Goulbourn Twp.	IX	9	Dept. of Defence Production Radio Physics Lab.	X	6	255	30	F	PS	40GPM PL 35 48 HRS.	DIRT 2; SANDSTONE 255
44	City of Ottawa			Central Experimental Farm	X	8	406	12	F	PS	58 GPM PL 12 48 HRS.	DRIFT 4; SHALE 230; SANDSTONE 406
45	City of Ottawa			Carleton University	X	6	170	23	F	C	75 GPM PL 160 I HR.	BLUE CLAY AND BOULDERS 15; GREY LIMESTONE 170
46	City of Ottawa			L. Sipolins	X	8	455	4	F	PS	50 GPM PL 50 12 HRS.	SILT 4; LIMESTONE 445; NEPEAN SANDSTONE 455
47	City of Ottawa			Bibblee Construction	X	8	230	Top	F	C, Ind.	55 GPM PL 130 24 HRS.	SANDY CLAY 18; HARDPAN 36; GREY LIMESTONE 230
48	Huntley Twp.	III	14	Dept. of Transport Carp Airport	X	12 8	58	14	F	PS	42 GPM PL 40 24 HRS.	SOIL 3; SAND 30; BLUE CLAY 48; COARSE SAND 58

TABLE 1A (cont.)

Well No.	Municipality	Con.	Lot	Owner	Drilled	Well Diam.	Depth	Static Level M. or R.	Quality	Use	Quantity	Remarks Log, etc.
49	Huntley Twp.	III	20	DND Carp #2	X	8	122	8'7"	F	PS	225 gpm PL 12'10" 26 hrs.	Soil 1; clay 55; sandy clay 87; sand and gravel 90; sand, gravel and boulders 122
49A	Huntley Twp.	III	20	DND Carp #2	X	10	129	11	F	PS	250 gpm PL 15 22 hrs.	Clay 15; silty blue clay 53; brown clay 72; clay and silty sand 87; sand, gravel and boulders 100; coarse sand and gravel 129; sand and gravel 129
50	Huntley Twp.	III	19	DND Carp #1	X	10	124	11	F	PS	250 gpm PL 17 72 hrs.	Surface 2; clay 45; silty clay 63; sand 70; silty clay 94; sand 98; coarse sand, gravel and boulders 124; sand 124
51	Nepean Twp.	ARF	34	Skyline Realty	X	10	59	8	F	PS	60 gpm PL 42 48 hrs.	Blue clay 50; sandy broken rock 55; limestone 59
52	Nepean Twp.	IRF	35	M. Loeb Ltd. (3 wells)	X	6½	250	10	F	C	100 gpm PL 150 24 hrs.	Silt boulders 48; limestone 250
53	Nepean Twp.	IIRF	27	Govt. of Canada Experimental Farm	X	10	247	35	F	PS	385 gpm PL 126 58 hrs.	Sand 66, grey limestone 155; Nepean sandstone 247
54	Nepean Twp.	VIRF	33	Butts Ross (Valley Land)	X	10	300	3	F	PS	220 gpm PL 143 48 hrs.	Loam 4; clay, stones 19; sandstone 300
55	Nepean Twp.	II of	18	Butts Ross (Valley Land)	X	10	250	14	F	PS	200 gpm PL 80 48 hrs.	Loam 8; blue clay and stones 12½; shale 94; limestone 175; hard limestone 250
56	Nepean Twp.	IIoF	18	Butts Ross (Valley Land)	X	10	250	41	F	PS	100 gpm PL 75 48 hrs.	Sandy clay 5; clay and stones 36; shale 112; limestone 160; hard limestone 250
57	Gloucester Twp.	BF	22	McRostie and Associates	X	6	127	4	F	TH	127 gpm PL 35 48 hrs.	Sand, clay and boulders 35; gravel and sand 42
58	Goulbourn Twp.	XI	31	Butts Ross (Valley Land)	X	10	415	47	F	BS	300 gpm PL 79 72 hrs.	Loam 8; limestone 78; sandstone 415

TABLE IA (CONT.)

WELL NO.	MUNICIPALITY	CON.	LOT	OWNER	DRILLED	WELL DIAM.	DEPTH	STATIC LEVEL M. OR R.	QUALITY	USE	QUANTITY	REMARKS LOG, ETC.
59	Nepean Twp.	II OF	15	Township of Nepean	x	12	89	13	F	PS	1000 GPM PL 35 48 HRS.	CLAY 46; SAND 55; FINE GRAVEL 70; COARSE GRAVEL 89
60	Gloucester Twp.	I OF	6	OWRC	x	8	228	10	F	TH	70 GPM PL 52 28 HRS.	CLAY 176; SMALL STONES 177; CLAY SILT 180; CLAY AND GRAVEL 188; GRAVEL AND FINE SAND 218; FINE SILT 221; ROCK 228
61	Nepean Twp.	I RF	26	L. Thatcher	x	10	350	9	F	PS	119 GPM PL 115 48 HRS.	CLAY 2; SAND 20; GRAVEL AND TILL 35; GREY LIMESTONE 170; WHITE SANDSTONE 320; SANDSTONE GRANITE 350

NOTE:

OF - Ottawa Front
RF - Rideau Front
BF - Broken Front
PL - PUMPING LEVEL
F - FRESH (WATER)
PS - PUBLIC SUPPLY
Irr. - IRRIGATION
Ind. - INDUSTRIAL
C - COMMERCIAL
TH - TEST HOLE

TABLE IB

GROUND WATER QUALITY

PHYSICAL AND CHEMICAL ANALYSES

COUNTY OF CARLETON

MUNICIPALITY	DATE TAKEN 1960	LOCATION AND COMMENTS	HARDNESS IN PPM	ALKALINITY IN PPM	IRON IN PPM	CHLORIDES IN PPM	pH
CITY OF OTTAWA	AUG. 23	OTTAWA HUNT AND GOLF CLUB RAW WELL WATER	232	200	0.4	4	7.9
TOWNSHIP OF GLOUCESTER	AUG. 31	CARDINAL HEIGHTS WATER SUPPLY-CHLORINATED	394	292	0.16	88	7.4
	DEC. 1	UPLANDS R.C.A.F. NO. 1 WELL	224	175	0.12	8	7.9
	DEC. 1	UPLANDS R.C.A.F. NO. 2 WELL	224	176	0.12	10	7.9
	DEC. 1	UPLANDS R.C.A.F. - RESERVOIR WATER	214	177	0.0	11	7.7
	AUG. 31	SODA SPRING - CARLSBAD SPRINGS - CON. VIII, LOT 3	20	452	0.16	296	8.2
	AUG. 31	LITHIA SPRING - CARLSBAD SPRINGS - CON. VII, LOT 3	304	656	TRACE	2450	7.8
	AUG. 31	WHITE SULPHUR SPRING - CARLSBAD SPRINGS - CON. VIII, LOT 3	168	672	0.0	1900	8.1
	AUG. 31	BEHIND R. BOYDS HEALTH HOTEL-CISTERN CON. VIII, LOT 3	30	16	0.08	0.0	6.5
	SEPT. 8	NO. 2 FLOWING WELL GREY NUNS NORTH OF NO. 17 HIGHWAY	240	354	0.16	237	8.5
	SEPT. 8	A. PAPINEAU WELL ORLEANS (HIGH SULPHUR CONTENT)	110	1080	0.72	546	8.4
	SEPT. 8	QUARRY ST. PIERRE STREET	68	66	TRACE	12	9.2
	SEPT. 8	NO. 1 FLOWING WELL GREY NUNS	189	296	0.16	82	8.0
	SEPT. 8	LAUROIX - BUTCHER ORLEANS	310	740	0.24	201	7.9

TABLE 18 (CONT.)

MUNICIPALITY	DATE TAKEN 1960	LOCATION AND COMMENTS	HARDNESS IN PPM	ALKALINITY IN PPM	IRON IN PPM	CHLORIDES IN PPM	pH
TOWNSHIP OF GOULBOURN	AUG. 23-25	QUARRY HWY. NO. 15 STITTSVILLE	140	132	0.0	3	8.3
	AUG. 18	RICHMOND MILLIE'S BEAUTY SALON (FLOWING WELL MAITLAND ST.)	268	254	0.0	21	7.4
	AUG. 18	RICHMOND K. MCCURDY - FLOWING WELL (MAITLAND STREET)	268	252	0.08	22	7.5
	AUG. 23-25	I.G.A. GROCERY (RICHMOND)	270	252	0.0	25	7.5
	AUG. 23-25	TWP. OFFICE STITTSVILLE	326	292	0.28	36	7.4
	AUG. 23-25	STITTSVILLE - MR. RITCHIE	352	372	0.12	18	7.3
TOWNSHIP OF NORTH GOWER	AUG. 23	RIDEAUVIEW GOLF COURSE - RAW WELL WATER	190	196	0.16	38	7.7
TOWNSHIP OF HUNTLEY	AUG. 23-25	POST OFFICE, VILLAGE OF CARP	234	204	0.48	8	7.7
TOWNSHIP OF MARLBOROUGH	AUG. 23-25	INDUSTRIAL FARM	256	258	TRACE	36	7.6
	AUG. 23-25	CONCESSION I, LOT 13 - G. DONNELLY	1100	444	36	136	7.2
	SEPT. 8	COMFORT STATION L & F PARK KEMPTVILLE	163	210	TRACE	18	8.1
	SEPT. 8	WELL NO. 6 L & F PARK, KEMPTVILLE	160	204	0.24	19	8.1
TOWNSHIP OF NEPEAN	AUG. 23-25	CON. 6, LOT 10, MR. SEABROOK (HIGH SULPHUR CONTENT)	132	392	0.0	716	7.9
	DEC. 1	CARLETON LODGE WELL	TRACE	222	TRACE	15	7.9
	AUG. 31	SHIRLEY BAY D.R.B. SITE TREATED WELL WATER	306	228	0.0	71	7.2
	1961						
	APRIL 14	MEADOWLANDS	182	128	TRACE	33	7.9
	APRIL 14	CRESTVIEW	164	118	2.20	63	7.8
	APRIL 14	MANORDALE	164	156	TRACE	36	7.6
	APRIL 14	LYNWOOD	146	168	0.0	19	8.0
	APRIL 14	LYNWOOD #2	126	102	0.0	8	8.0
	APRIL 14	LAKEVIEW	198	178	0.2	11	7.8
	APRIL 14	PARKWOOD HILLS	214	220	TRACE	20	7.5

TABLE IB (CONT.)

MUNICIPALITY	DATE TAKEN 1960	LOCATION AND COMMENTS	HARDNESS IN PPM	ALKALINITY IN PPM	IRON IN PPM	CHLORIDES IN PPM	pH
Township of Osgoode	Aug. 18	J. McMartin, Con. 4, Lot 39 Formerly Flowing Well	648	244	0.32	1446	7.3
	Aug. 18	C. Quaile, Con. 7	274	250	0.64	21	7.7
	Aug. 18	E. Armstrong, Con. 6, Lot 39 Flowing Well	324	300	0.08	Trace	7.4
	Aug. 23	Meteor Observatory - Well Water - Chlorinated	282	222	0.36	5	7.7

WATER RESOURCES SURVEY

- County of Carleton -

CHAPTER 4

SURFACE WATER

I GENERAL

The availability of surface water has played a significant part in the development of Carleton County by providing water for municipal supply, industry, agriculture, recreation, transportation and water-power. In this regard the Ottawa River, the receiving body for the drainage from the entire county, has been vitally important. Industrial, commercial and municipal development has always concentrated near a readily-available source of good-quality water. Development in Carleton County has followed this trend.

In this section each of the watercourses in the county is discussed under separate heading with regard to characteristics, watershed area, uses and water quality. The watershed boundaries, drainage areas and stream sampling locations are shown on Figure 3. The laboratory results pertaining to stream samples are shown in Table II.

II WATERCOURSES

1. Ottawa River

The Ottawa River which flows generally in an easterly direction across the region, forms the northern boundary of Carleton County. The stream gradient varies, consisting of a series of lake-like reaches where the gradient is low, separated by falls and rapids. At Chaudiere Falls near Ottawa, the river falls 25 to 30 feet over flat-lying limestone; above the falls a series of rapids separate short quiescent stretches. Above Deschenes Rapids, near Britannia, the river occupies in part a broad rock valley and forms an extensive lake-like expanse known as Lake Deschenes. From Lake Deschenes the river is navigable almost to the west boundary of the county in the vicinity of Fitzroy Harbour, immediately west of which is the Chats Falls power dam. Below the City of Ottawa the river has a very low gradient and flows in a valley largely underlain by marine clays, the bedrock being rarely exposed.

The navigation locks at Carillon, the only navigation locks on the Ottawa River, enable water craft to navigate the entire stretch of the river from Ottawa to the St.Lawrence. A study of the existing and potential regulation of the waters of the Ottawa River basin has been made by the Department of Northern Affairs and National Resources and a report entitled "Hydrologic Investigations of the Ottawa River Basin", was published in 1962.

There is no flow recording gauge on the Ottawa River at present, although there is a number of elevation gauges. Until the recent construction of the Carillon Power Project a gauge was maintained at Grenville, approximately 50 miles downstream from the county. The maximum, average and minimum flows indicated during the period of record at the Grenville gauge were 287,000, 68,600 and 23,270 cfs.respectively. Although these flows were gauged some distance from the county they may be considered as representative of flows within the county.

The Ottawa River water is used for industrial and domestic water supplies, recreation, navigation, logging, power development and assimilation of domestic and industrial wastes. Studies on the development of the river as a seaway route have been initiated.

From the upstream limit of Carleton County to the City of Ottawa, the sanitary chemical and bacteriological qualities of the Ottawa River water were satisfactory. The pertinent laboratory results indicate a pronounced deterioration in the quality of the watercourse as it flows past the City of Ottawa. An abrupt increase in coliform content is immediately evident within the city. This adverse bacteriological quality persists to the downstream limit of the county. Appreciable contents of phenol or phenolic equivalents were evident at sample point number 0.127.1 and sample point 0.117.9, which are located at Gatineau Point and at the downstream limit of the county, respectively. The adverse stream quality obviously results from sanitary and industrial wastes gaining access to the river either directly or via tributaries.

2. Bilberry Creek

Bilberry Creek drains a relatively small area in the north-east part of the county and discharges to the Ottawa River almost at the east county boundary.

Slight bacterial pollution was detected in the west branch of Bilberry Creek at Highway 17.

3. Green Creek

Green Creek, draining an area of approximately 37 square miles in the north-east portion of the county, discharges to the Ottawa River about six miles east of the City of Ottawa. The flow in the creek varies from sluggish in the headwaters to relatively rapid in the central section, then sluggish again in the deep gully as it approaches the Ottawa River.

Use is made of the creek waters to assimilate the effluent from a small municipal sewage treatment plant.

High coliform contents were revealed in this watercourse at its mouth where the flows are sluggish, at Ridge Road, and upstream from the junction with McEwen Creek.

4. South Nation River

The headwaters of the South Nation River drain approximately 175 square miles of the southwestern portion of the county. The main tributaries draining this area are the Castor River and Bear Brook.

Due to the unreliable flows in these streams, limited use is made of the waters.

With respect to sanitary chemical and bacteriological qualities, the conditions of these waters were generally satisfactory during the recent period of sampling. Industrial waste from a dairy and the effluent from a small sewage treatment plant are discharged to this river system within the county.

5. Rideau River

The Rideau River has a total drainage area of 1,514 square miles of which 380 square miles are within Carleton County. The river consists of a series of lakes connected by lift-locks and channels. From Smiths Falls to Ottawa the canal follows the course of the river. At Ottawa the canal and river separate, the canal passing through the centre of the city, the river section flowing around the south-east end of the city. Where the Rideau enters the Ottawa River it falls some 50 feet over the limestone in the escarpment which forms the south bank of the Ottawa River. On the top of the escarpment the river is divided by Green Island, forming twin falls. Throughout the greater part of its course within the county, the Rideau occupies a valley which is floored by drift deposits, the bedrock outcropping sporadically. Rapids and falls occur at these bedrock outcrops, as at Black Rapids, north of Manotick; Hog's Back, within four miles of the centre of Ottawa; and south of Cummings Bridge, within the city.

The flow in the Rideau is maintained at a minimum of 300 cfs. to enable operation of the lift-locks during navigation season. The flow is controlled above Smiths Falls, the source being Rideau Lake. There is a manual stream gauge on the Rideau near Hurdman's Bridge within the City of Ottawa. Continuous records for the gauge are available from 1945 to date. The maximum, average and minimum flows for the period of record are 19,000, 1,380 and 117 cfs. respectively.

The river is used as a source of water for irrigation, recreation, navigation and to some extent power development. It is the receiving body for a small amount of treated sewage.

Although the laboratory results pertaining to water samples collected from the Rideau River during 1963 reveal a high coliform content as the watercourse enters Carleton County(sample point number R.43.9), the quality of the stream was generally satisfactory throughout the remainder of its course with some exceptions. High coliform contents were indicated at sample point number R.13.1 which is located downstream from the mouth of Mosquito Creek, and at sample point number R.11.0E which is located at the Black Rapids Locks, east side. Adverse bacteriological quality also was indicated in the river water at Billings Bridge and at Hurdman Bridge. High 5-day BOD and coliform contents were revealed in the creek flowing from Uplands Airport, and in the creek which receives untreated sewage flows in the City View area of Nepean Township and empties into the Rideau River near the City of Ottawa.

6. Pinecrest Creek

A small watercourse draining the western section of the City of Ottawa, Pinecrest Creek empties into the Ottawa River downstream from the Deschenes Rapids. It has a drainage area of approximately six square miles.

It was evident during the recent sampling program that the sanitary chemical and bacteriological qualities of the creek water were high where the creek entered the City of Ottawa. An improvement in stream quality was indicated near the creek mouth.

7. Graham Creek

Graham Creek has its source in Concession III, Township of Nepean. It flows northerly and discharges to the Ottawa River at Graham Bay.

Satisfactory conditions were indicated with respect to stream quality.

8. Stillwater Creek

The area lying in the vicinity of Bells Corners is drained by Stillwater Creek. The creek discharges to the Ottawa River at Graham Bay.

A high coliform content was revealed in the creek water at sample point number ST.0.4 which is located at the township road upstream from the mouth of this small watercourse.

9. Watts Creek

The drainage area of Watts Creek is approximately seven square miles, and lies almost entirely within the Green Belt area surrounding the City of Ottawa.

The creek receives the effluent from the Nepean Township water pollution control plant and from the Connaught Rifle Range septic tank.

Satisfactory conditions with respect to stream quality were revealed in the upper reaches of Watts Creek. High 5-day BOD contents were revealed in the creek water in the lower reaches downstream from the Nepean Township W.P.C.P. outfall.

10. Shirleys Brook

This creek drains a small area, approximately 11 square miles, in the vicinity of South March. It discharges to the Ottawa River at Shirleys Bay.

No samples were obtained from this watercourse during the recent sampling program.

11. Constance Creek

Constance Creek has its headwaters in the Township of March, and drains a total area of 60 square miles of the Townships of March and Torbolton. It discharges to the Ottawa River at Constance Bay.

Satisfactory conditions were revealed in this creek, according to the pertinent laboratory results.

12. Carp River

The Carp River lies entirely within the county, draining approximately 115 square miles in the north-west region. The headwaters of the river rise near the Village of Stittsville. The flow in the upper reaches is negligible and in the lower reaches sluggish during the summer months.

The prime uses of the stream are cattle-watering and fire protection. The effluent from the Department of National Defence sewage lagoon discharges to the Carp River. Two cheese factories discharge industrial wastes to this watercourse.

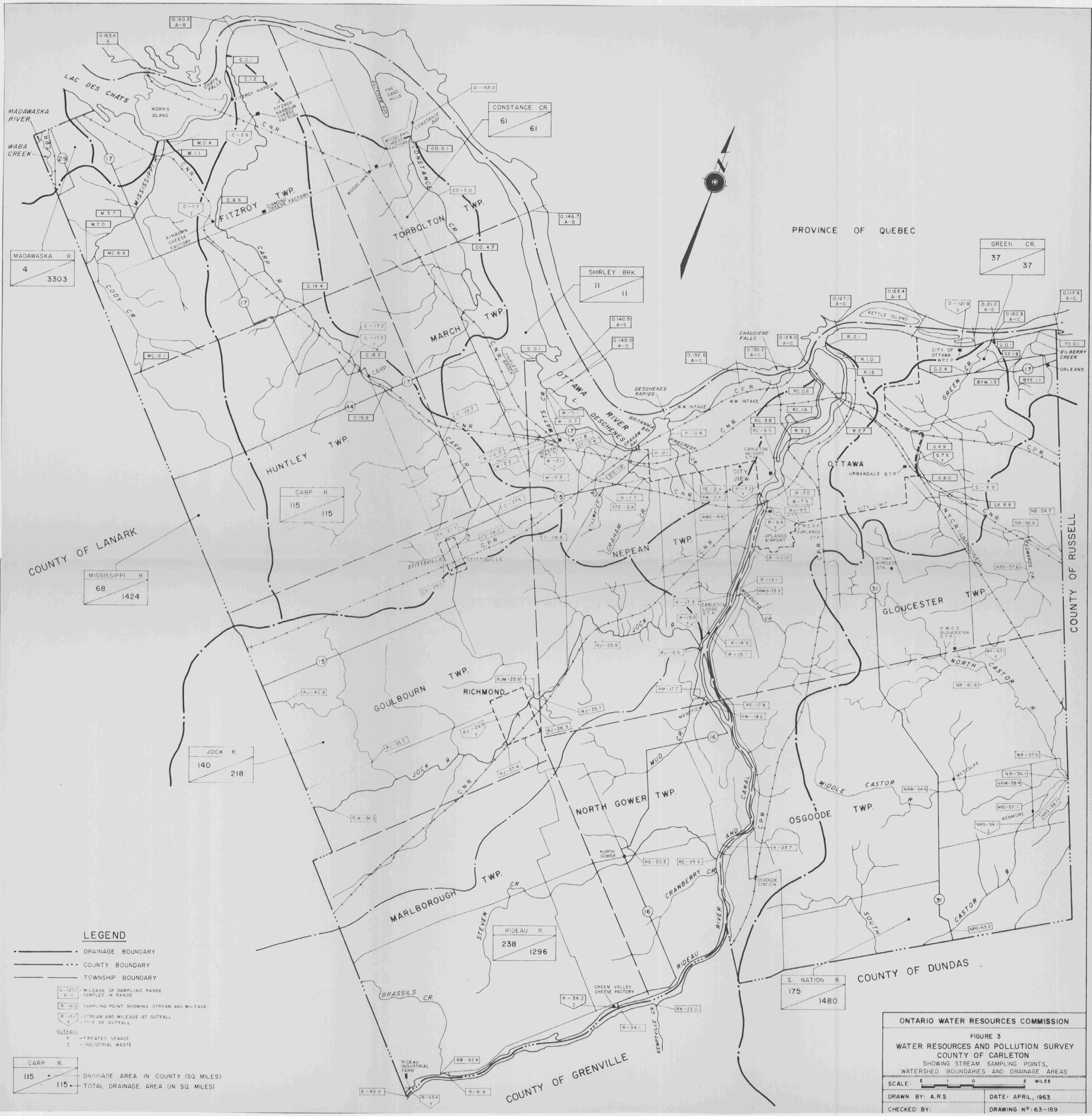
The laboratory results pertaining to samples collected from the Carp River in 1963 revealed a high coliform content at the Nepean-Goulbourn boundary in the upper reaches of the watercourse, and at the bridge south-east of the community of Carp. A high 5-day BOD content was revealed in the river immediately downstream(sample point number C.17.2) from the E.M.O. lagoon outfall.

13. Mississippi River

The Mississippi River drains an area of approximately 68 square miles of the county in the extreme north-west corner. It discharges to the Ottawa River at Lac des Chats.

The Mississaippi River is used as a source of domestic water supply and as the receiving body for waste discharges by municipalities located in the adjacent County of Lanark.

The sanitary chemical and bacteriological qualities of the Mississippi River and its tributaries were satisfactory. The high coliform content revealed in the river near its mouth in 1962 was not evident during the recent period of sampling.



ONTARIO WATER RESOURCES COMMISSION

FIGURE 3

WATER RESOURCES AND POLLUTION SURVEY
COUNTY OF CARLETON
SHOWING STREAM SAMPLING POINTS,
WATERSHED BOUNDARIES AND DRAINAGE AREAS

SCALE: 2 1 0 2 MILES

DRAWN BY: A.R.S.	DATE: APRIL, 1963
CHECKED BY:	DRAWING N°: 63-189

TABLE II

ANALYSES OF STREAM SAMPLES

COUNTY OF CARLETON

OTTAWA RIVER

Sample Point No.	Location	Date of Sample	5-Day BOD (ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	(Sampling points designated from Ontario side)				
0.117.9	Ottawa River at Carleton/Russell Boundary				
	A - 1/4 of distance across river phenols in ppb. - 13	May 29/63	1.9	3.3	24,300
	B - 1/2 of distance across river phenols in ppb. - 11	May 29/63	2.0	3.5	12,300
	C - 3/4 of distance across river phenols in ppb. - 12	May 29/63	2.1	3.5	9,200
0.120.3	Ottawa River downstream from mouth of Green Creek				
	A - 1/4 of distance across river	Nov.7/61	7.2	5.5	18,600
		May 29/63	2.3	3.5	13,600
	B - 1/2 of distance across river	Nov.7/61	3.1	2.6	20,400
		May 29/63	2.3	3.3	17,400
	C - 3/4 of distance across river	Nov.7/61	12.0	3.5	17,100
		May 29/63	2.2	1.1	9,700

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
0.121.0	Ottawa River downstream from Lower Duck Island				
	A - 1/5 of distance across river	May 29/63	2.4	3.5	23,900
	B - 2/5 of distance across river	May 29/63	1.9	3.5	14,300
	C - 3/5 of distance across river	May 29/63	1.7	3.3	15,100
	D - 4/5 of distance across river	May 29/63	1.5	2.3	5,700
0.123.4	Ottawa River downstream from Kettle Is.(city limits)				
	A - At Ontario side	Aug.16/60	1.8	4.0	121,000
		Nov.7/61	2.8	2.6	6,800
		July26/62	2.2	5.0	6,800
		May 29/63	2.0	2.9	17,200
	B - 1/4 of distance across river	Nov.7/61	2.7	2.8	6,100
		May 29/63	2.8	3.3	20,400
	C - 1/2 of distance across river	Aug.16/60	1.3	4.0	148,000
		Nov.7/61	2.7	2.3	9,800
		May 29/63	2.1	3.3	20,800

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	D - 3/4 of distance across river	Nov.7/61	2.8	2.6	3,700
		May 29/63	1.4	3.5	6,000
	E - At Quebec side	Aug.16/60	0.5	7.0	194,000
		Nov.7/61	37.0	9.5	15,400
		July 26/62	1.3	5.0	10,400
		May 29/63	15.0	4.0	182,000
0.127.1	Ottawa River at Gatineau Point				
	A - 1/4 of distance across river	Aug.16/60	1.9	6.0	141,000
		Nov.6/61	3.5	2.8	900
	phenols in ppb.- 6	May 29/63	2.2	2.6	95,000
	B - 1/2 of distance across river	Aug.16/60	1.5	5	179,000
		Nov.6/61	3.6	2.3	2,000
	phenols in ppb.- 5	May 29/63	1.6	2.6	570
	C - 3/4 of distance across river	Aug.16/60	1.2	6	180
		Nov.6/61	3.0	2.5	1,400
	phenols in ppb.- 4	May 29/63	1.6	2.6	115,000
0.129.0	Ottawa River at Interprovincial Bridge				
	A - 1/4 of distance across river	Aug.16/60	2.0	4	270
		July 26/62	1.3	1.5	6,500
		May 29/63	1.8	2.6	9,700
	B - 1/2 of distance across river	Nov.6/61	3.6	2.8	14,400
		July 26/62	1.2	1.3	250,000
		May 29/63	2.3	2.6	19,000
	C - 3/4 of distance across river	Aug.16/60	2.2	5	77,000
		July 26/62	1.8	1.1	--
		May 29/63	3.0	2.6	10,300

Table II cont.

Sample Point No.	Location	Date of Sample	5 Day BOD (ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
0.130.2	Ottawa River at Chaudiere Bridge				
	A - 1/4 of distance across	May 29/63	1.2	2.6	110
	B - 1/2 of distance across	Nov.8/61	1.1	3.6	128
		May 29/63	1.2	2.6	220
	C - 3/4 of distance across	May 29/63	1.4	2.6	270
0.132.6	Ottawa River-Champlain Bridge				
	A - 1/4 distance across river	May 30/63	1.6	2.3	16
	B - 1/2 distance across river	Nov.8/61	2.0	3.3	12
		May 30/63	1.9	2.3	20
	C - 3/4 distance across river	May 30/63	1.7	2.3	14
0.140.0	Ottawa River- downstream from mouth of Watts Creek				
	A - at Ontario shore	May 31/63	1.8	3.1	24
	B - 1/4 distance across river	May 31/63	1.6	2.1	68
	C - 1/2 distance across river	May 31/63	1.2	5.5	500
	D - 3/4 distance across river	May 31/63	1.4	5.0	54

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
0.140.5	Ottawa River- upstream from mouth of Watts Creek				
	A - 1/4 distance across river	May 31/63	1.4	3.1	12
	B - 1/2 distance across river	May 31/63	0.8	3.5	10
	C - 3/4 distance across river	May 31/63	1.8	2.6	12
0.146.7	Ottawa River- at Torbolton-March Boundary				
	A - at Ontario side	July 25/62			42
		May 29/63	1.5	Susp.solids- 3	40
	B - at Quebec side	May 31/63	1.6	40	30
0.153.2	Ottawa River- at Constance Bay Beach	May 29/63	1.9	Susp.solids- 6	60
0.160.6	Ottawa River- at Moore Landing-Quyon Ferry				
	A - 1/3 of distance across river	May 29/63	1.4	Susp.solids- 4	96
	B - 2/3 of distance across river	May 29/63	1.3	Susp.solids- 9	290
0.163.6	Ottawa River- at Chats Falls Generating Station				
	A - (1 sample)	Aug.10/60	1.8	4.0	370
		Nov.7/61	2.2	2.3	0
		May 29/63	1.5	Susp.solids- 2	170

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	BILBERRY CREEK				
BY.0.1	Bilberry Creek upstream from mouth at Ottawa River	--	--	---	---
BYW.1.3	West Branch at Hwy.17(North Route)	May 28/63	3.3	12.5	6,800
BYE.1.1	East Branch at Hwy.17(North Route)	May 28/63	2.2	53	830
	GREEN CREEK				
G.0.1	Green Creek just upstream from Ottawa River	Aug.25/60	2.3	--	56,000
		Nov.7/61	6.2	5.5	8,900
		July 26/62	1.2	1.4	6,500
		May 29/63	3.4	53	50,000
GE.1.8	East Branch at Hwy.17(North Route)	May 28/63	1.8	21	970
G.2.4	Green Creek at Hwy.17	Aug.25/60	3.6	--	80
		May 28/63	2.7	23	920
G.4.9	Green Creek at Innes Road	Aug.25/60	2.2	10	160
		May 28/63	4.2	11	1,070
G.8.0	Green Creek at Ridge Road	Aug.30/60	5.2	73	20,000
		May 28/63	4.6	53	510
GX.8.8	McEwen Creek upstream from confluence	May 28/63	1.7	10	770
G.8.9	Green Creek at road upstream from junction with McEwen Creek	May 30/63	2.4	27	95,000

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	SOUTH NATION RIVER				
NR.56.1	Castor River at Carleton-Russell Boundary	May 27/63	1.7	2.5	74
NRS.56.1	South Castor River at Carleton-Russell Boundary	May 27/63	1.8	3.5	46
NRS.57.1	South Castor River at side road one mile N.E. of Kenmore	Sept.7/60	1.6	2	310
		May 27/63	1.8	6	24
NRS.65.2	South Castor River at Hwy.31-S. of Vernon	Sept.7/60	4.4	11	520
		May 27/63	2.2	6.5	120
NRM.58.4	Middle Castor River at Con.Rd.9 - Twp. of Osgoode	Sept.7/60	1.2	2	250
		May 27/63	1.7	3.5	34
NRM.64.6	Middle Castor River at Hwy.31	Sept.7/60	3.6	Susp.solids-138	4,000
		May 27/63	2.2	3.6	14
NR.57.0	Castor River at side road 0.25 miles north of junction with Middle Castor R.	Sept.7/60	1.3	2	810
		May 27/63	2.5	4.5	38
NR.61.6	Castor River at Con.Rd.8 - Twp. of Osgoode	Sept.7/60	1.6	5	840
		May 27/63	2.3	5	78
NB.54.7	Bear Brook at County Boundary, E. of Carlsbad Springs	Aug.30/60	6.4	33	20,000
		May 27/63	2.2	26	660

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	SOUTH NATION RIVER - cont.				
NBE.57.8	Edwards Creek at Con.Rd.8, Twp.of Gloucester	Aug.30/60	5.6	49	50,000
		May 27/63	1.6	23	220
NB.56.6	Bear Brook at diagonal road just upstream junction Edwards Creek	Aug.30/60	4.0	27	120,000
		May 27/63	4.0	27	36
	RIDEAU RIVER				
R.0.1	Rideau River at Sussex Ave. - City of Ottawa	Aug.17/60	1.8	4.0	320
		Nov.1/61	1.7	2.3	126
		Aug.27/62	1.4	4.0	150
		May 28/63	2.1	3.8	104
R.1.0	Rideau River at St.Patrick St. bridge	Aug.17/60	1.3	5.0	840
		Nov.1/61	2.5	2.1	52
		May 28/63	2.1	3.5	142
R.1.5	Rideau River at Rideau St.	Aug.17/60	1.8	5.0	-
		Nov.1/61	5.0	2.5	58
		Aug.27/62	1.8	3.8	740
		May 28/63	2.2	3.5	200
R.2.7	Rideau River at Hurdman Bridge	Aug.17/60	1.1	4.0	370
		Nov.1/61	2.6	2.0	42
		May 28/63	1.8	3.3	6,800
R.5.1	Rideau River at Billings Bridge	Aug.17/60	1.5	4.0	540
		Nov.1/61	1.8	2.0	102
		Aug.27/62	2.0	4.0	320
		May 28/63	2.0	2.8	9,800

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	RIDEAU RIVER - cont.				
R.7.0	Rideau River at Hogs Back	Aug.17/60	2.2	4.0	340
		Nov.3/61	3.0	3.1	28
		Aug.27/62	-	-	1,100
		May 28/63	2.0	3.8	164
RC.0.6	Rideau Canal at Wellington St.	May 28/63	4.0	3.5	28
RC.1.6	Rideau Canal at Pretoria Bridge	Aug.17/60	2.1	8.0	240
		May 28/63	3.5	3.5	14
RC.3.5	Rideau Canal at Bronson Ave.	Aug.17/60	4.3	13.0	190
		Nov.3/61	2.8	4.5	28
		Aug.27/62	-	-	90
		May 28/63	4.4	6.0	12
RC.5.5	Rideau Canal at Hogs Back	Nov.1/61	2.2	2.5	50
		Aug.27/62	-	-	48,000
		May 28/63	2.4	5.5	112
R.7.3	Rideau River just upstream from Carleton Heights S.T.P. outfall	May 28/63	4.2	27	420
RME.8.6	Creek from Merivale Area- at Hwy.16	May 29/63	13	6.5	227,000
RU.9.5	Creek from Uplands Airport- at Riverside Drive	Aug.17/60	3.2	5.0	140
		May 29/63	6.8	8.0	4,700

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml
	RIDEAU RIVER - cont.				
R.11.0W	Rideau River at Black Rapids Locks- west side	Aug.11/60	0.7	2.0	70
		Nov.3/61	2.8	2.6	16
		May 29/63	1.4	3.1	30
R.11.0E	Rideau River at Black Rapids Locks- east side	Aug.11/60	2.0	3.0	30
		Nov.2/61	2.8	2.0	44
		May 29/63	1.5	3.1	11,000
R.13.1	Rideau River just downstream from mouth of Mosquito Creek	May 29/63	1.7	2.6	23,000
RMO.13.3	Mosquito Creek at road upstream from mouth	May 29/63	1.5	3.5	170
R.13.3	Rideau River just upstream from mouth of Mosquito Creek	May 29/63	1.6	4.0	130
R.14.9	Rideau River just downstream from Carleton Lodge S.T.P. outfall	May 29/63	1.5	4	240
R.15.1	Rideau River just upstream from Carleton Lodge S.T.P. outfall	May 29/63	1.6	4	190

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	RIDEAU RIVER - cont.				
RJ.15.5	Jock River at Hwy.16 - near mouth	Nov.2/61	2.9	2.3	21
		May 29/63	1.1	1.8	134
RJ.20.8	Jock River at Con.Rd.4 - Twp. of Nepean	Nov.2/61	3.1	2.0	26
		May 29/63	1.6	2.0	238
RJ.25.7	Jock River at Nepean-Goulbourn Boundary	Aug.18/60	2.3	2.0	170
		Nov.2/61	2.5	3.8	66
		May 28/63	1.5	2.3	620
RJM.25.9	Mansfield Creek at Richmond Rd.	May 28/63	2.8	23	1,200
RJ.26.3	Jock River at East Limit-Village of Richmond	May 28/63	1.6	2.5	1,300
RJ.27.4	Jock River at South Limit of Richmond	Nov.2/61	2.2	2.0	128
		May 28/63	1.5	1.1	104
RJ.35.7	Jock River at Richmond-Dwyer Hill Rd.	May 28/63	1.8	2.6	168
RJ.40.8	Jock River near Lanark-Carleton Boundary	May 28/63	1.6	0.8	900
RJK.36.0	King Creek at Dwyer Hill Rd.	May 28/63	2.5	1.8	198

Table II - cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	RIDEAU RIVER - cont.				
RM.17.7	Mud Creek at Hwy.16	May 29/63	2.1	2.3	82
RE.17.8	Rideau River at Manotick Bridge - E. channel	Aug.22/60	1.3	4.0	20
		Nov.2/61	2.2	2.3	28
		Aug.27/62	-	-	170
		May 29/63	1.5	2.3	50
RW.18.2	Rideau River at Manotick Bridge - W. channel	Aug.22/60	1.9	4.0	600
		Nov.3/61	2.2	2.3	6
		Aug.27/62	-	-	430
		May 29/63	2.1	2.3	98
R.23.7	Rideau River at new Kars Bridge	Nov.1/61	1.9	1.8	2
		Aug.27/62	-	-	110
		May 27/63	3.5	1.8	2
RS.25.6	Steven Creek at bridge upstream from mouth	Aug.22/60	2.9	4.0	70,000
		May 27/63	1.7	3.1	20
RS.30.3	Steven Creek at P.V. of North Gower	Aug.23/60	3.6	11.0	12,000
		May 27/63	2.0	6.0	212
RK.33.0	Kemptville Creek- 0.5 miles upstream from mouth	Aug.23/60	1.9	7	200
		Nov.1/61	2.8	2.3	0
		May 27/63	1.7	1.4	3,900

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	RIDEAU RIVER - cont.				
R.34.1	Rideau River at Becketts Landing Bridge	Nov.1/61	2.1	2.3	0
		Aug.27/62	-	-	59,000
		May 27/63	1.9	2.0	116
R.41.8	Rideau River at Burritts Rapids Dam.	May 27/63	1.9	2.6	12
RB.42.4	Brassils Creek near mouth	Aug.23/60	1.7	5.0	100
		May 27/63	1.7	1.1	112
R.43.9	Rideau River at County boundary	May 27/63	1.9	2.3	26,000
	PINECREST CREEK				
P.0.4	Pinecrest Creek at Hwy.15 (Richmond Road)	Aug.25/60	9.0	85.0	570
		May 28/63	5.6	8.5	1,000
PE.2.4	East Branch at city limit	Aug.25/60	2.4	Susp.solids-46	780
		May 28/63	11.0	8.5	12,800
PW.2.4	West Branch at city limit	Creek not exposed for sampling			
	GRAHAM CREEK				
H.0.1	Graham Creek at Hwy.17	Aug.25/60	1.2	17.0	1,900
		May 28/63	2.0	5.0	1,100
H.1.7	Graham Creek at Base Line	Aug.25/60	1.7	15.0	400
		May 28/63	1.9	3.6	126

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	STILLWATER CREEK				
ST.0.4	Stillwater Creek at twp.road	Aug.25/60	4.0	38.0	500
		May 28/63	1.6	3.5	8,700
STE.1.8	East Branch at C.N.R. crossing	May 28/63	1.5	2.6	182
STE.2.4	East Branch at Base Line Road (Hwy.15 at Bells Corners)	May 28/63	1.2	1.5	2,200
	WATTS CREEK				
W.0.1	Watts Creek at mouth	May 31/63	8.8	3.1	140
			(Total Solids- 400)		
W.0.3	Watts Creek at Shirleys Bay Rd.	Aug.25/60	2.2	13.0	80
		Nov.7/61	7.6	3.5	0
W.1.8	Watts Creek at Hwy.17	Aug.25/60	35.0	Susp.solids-50	166,000
		May 27/63	14.0	8.0	630
W.2.0	Watts Creek just downstream from Nepean W.P.C.P. outfall	May 28/63	7.2	10	June 11/63- 10
W.2.2	Watts Creek just upstream from Nepean W.P.C.P. outfall	May 28/63	1.8	4.5	June 11/63- 158
W.4.3	Watts Creek at Nepean-March boundary	Aug.25/60	9.0	Susp.solids-204	19,000
		May 29/63	1.8	Susp.solids- 26	1,110

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml
	SHIRLEYS BROOK				
S.0.1	Shirleys Brook near mouth	--	--	--	--
	CONSTANCE CREEK				
CO.0.1	Constance Creek near mouth	--	--	--	--
CO.3.0	Constance Creek at road 3 miles south-east of Woodlawn	May 29/63	0.9	Susp.solids- 6	210
CO.4.7	Constance Creek at Torbolton-March boundary	May 29/63	1.3	Susp.solids- 2	62
	CARP RIVER				
C.0.1	Carp River at end of road near mouth	Aug.24/60	3.6	11.0	100
		Nov.7/61	2.5	2.0	0
		May 28/63	1.4	2.6	140
C.1.2	Carp River at bridge N.E. of Fitzroy Harbour	Aug.24/60	2.7	10.0	40
		May 28/63	1.3	1.8	17
C.8.6	Carp River at bridge 0.5 miles N.W. of Kinburn	Aug.24/60	11.0	8.0	60,000
		May 28/63	1.7	4.0	29
C.14.4	Carp River at Fitzroy-Huntley boundary	May 28/63	1.9	8.0	64
C.17.2	Carp River downstream from E.M.O. lagoon outlet	May 27/63	11	Susp.solids- 10	770

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	CARP RIVER - cont.				
C.18.2	Carp River at Hwy.17 just downstream from Carp	Aug.25/60	2.4	9.0	40,000
		May 28/63	--	--	--
C.19.8	Carp River at bridge S.E. of Carp-near C.N.R.	Aug.25/60	2.3	9.0	450
		May 28/63	2.1	2.6	17,500
C.22.7	Carp River at Huntley-March boundary	May 29/63	1.5	Susp.solids- 6	90
CS.27.3	Stittsville Creek at Hwy.15	May 29/63	1.7	Susp.solids- 5	420
CS.28.0	Stittsville Creek at downstream limit of Stittsville	May 29/63	1.6	Susp.solids- 6	178
CS.29.0	Stittsville Creek near upstream limit of Stittsville	May 29/63	2.4	Susp.solids- 6	230
C.27.5	Carp River at Hwy.15	May 29/63	2.4	Susp.solids- 9	120
C.28.9	Carp River at Nepean-Goulbourn boundary	May 29/63	1.5	Susp.solids- 19	8,000

Table II cont.

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	MISSISSIPPI RIVER				
M.0.4	Mississippi River at north end of road from Galetta	Aug.24/60	1.6	6	70
		Aug.28/62	1.1	2.1	12,300
		May 28/63	1.3	3.5	118
M.1.1	Mississippi River at R.R.bridge just upstream from Galetta	Aug.24/60	1.5	7	130
		Nov.7/61	2.4	2.3	0
		May 28/63	1.4	3.1	124
M.3.7	Mississippi River at Hwy.17	Aug.24/60	1.1	5	300
		Aug.28/62	-	-	62
		May 28/63	1.4	2.9	142
MC.6.9	Cody Creek at first side road upstream from confluence	Aug.24/60	3.2	31.0	480
		May 28/63	1.5	11.5	580
MC.12.1	Cody Creek at Panmure side road	Aug.24/60	2.4	21.0	830
		May 28/63	1.5	10.0	2,200
M.7.0	Mississippi River at Carleton-Lanark County boundary	May 28/63	1.6	2.8	208

CHAPTER 5

NATIONAL CAPITAL REGION

I GENERAL

The corporation known as the National Capital Commission was established in 1959 subsequent to the passing of the National Capital Act. The Commission consists of 20 members who hold office for terms not in excess of four years.

The purpose of the National Capital Commission is to prepare plans and assist in the development, conservation, and improvement of the National Capital Region. This area is comprised of approximately 1800 square miles and 58 municipalities of which 21 are located in Ontario.

The N.C.C. has provided financial assistance in regard to water and sewerage programs carried out in the Region.

II THE GREEN BELT

The Green Belt is a product of active planning in the National Capital Region, and was designed for several purposes. Briefly, these include:

1. - to prevent urban sprawl around the Capital;
2. - to meet long-term planning needs with regard to further government and industrial building;
3. - to place a practical limit on the growth of the Capital.

The latter point is related to economic municipal services.

CHAPTER 6

CITIES

The Cities of Ottawa and Eastview are considered first, followed by the villages and townships. This chapter deals with Ottawa and Eastview.

CITY OF OTTAWA

I GENERAL

The area of Ottawa is 30,482 acres. The population in 1963 is in excess of 270,000.

II WATER SUPPLY

1. Source

The City of Ottawa presently utilizes two water purification plants with the Ottawa River being the source of supply. The Lemieux Island plant and the Britannia Bay works are located approximately two miles and five miles upstream from the downtown area, respectively. The combined capacity of these purification works approximates 84 million gpd.

Uplands Airport is supplied by a separate water works system which relies on three drilled wells having a total capacity of 550 gpm as its source of supply. The supply is chlorinated and is sampled for bacteriological analyses regularly. This system appears to be adequate to meet the present and future demands.

Ground water is also in use at the Central Experimental Farm and the Ottawa Hunt and Golf Club.

2. Water Purification Plants

The Lemieux Island Water Purification Plant is the older of the two plants and is comprised of low lift pumps, mixing and settling basins, rapid sand filters, a clear water well, and high lift pumps. Chemical treatment consists of pre- and post-chlorination, and coagulation with aluminum sulphate. Lime is added on the suction side of the high lift pumps as a corrosion control measure.

The design plant flow is indicated as 42 million gallons per day.

The Britannia Bay Water Purification Plant was constructed during 1960-61 under OWRC Approval Certificate No.58-B-425.

The capacity of this plant is indicated as 42 million gallons per day, thereby duplicating the capacity of the Lemieux Island works. The plant consists of intake conduit, travelling screens, mixing and settling tanks, rapid sand filters, two clear water wells, and high and low lift pumping units. Chemical treatment similar to that utilized at the Lemieux Island plant is effected.

3. Pumpage

The following data is provided with respect to combined pumpage from the two water purification plants during 1962:

Daily average - 26,845,260 gallons
Daily per capita - 89.445 gallons
Maximum daily pumpage(June 7) - 37,859,300 gallons
Minimum daily pumpage(April 29) - 19,207,760 gallons
Maximum hourly rate - 66.5 million gpd
Minimum hourly rate - 11.75 million gpd

4. Distribution

These two water purification plants serve the City of Ottawa, the City of Eastview, the Village of Rockcliffe Park, as well as sections of the Townships of Gloucester and Nepean.

The population served by city water during 1962 was as follows:

Ottawa	271,465
Eastview	25,105
Rockcliffe Park	2,289
Nepean	1,037
Gloucester	234
TOTAL POPULATION	300,130

Six pumping stations are utilized in the distribution system and are located respectively on Fleet Street, Slater Street, Carling Avenue, at Billings Bridge, on Brittany Drive, and at Carlington Heights(temporary).

Existing storage in the system consists of:

- clear water well at the Lemieux Island plant - 6 million gallons;
- clear water well at the Britannia Bay plant - 2 million gallons;
- Montreal Road ground level reservoir - 0.5 million gallons;
- Carlington Heights ground level reservoir - 24 million gallons;
- Carling Avenue elevated tank- 0.75 million gallons;
- Alta Vista elevated tank - 0.75 million gallons.

III WATER REQUIREMENTS FOR THE FUTURE

The city's existing water treatment facilities appear to be adequate for the future. The Ottawa River is virtually an unlimited source of water supply.

If it is necessary to augment the water supply for Uplands Airport in the future, it is likely that suitable quantities of potable ground water could be found locally.

IV WATER POLLUTION

1. Sanitary Waste Disposal

(a) Existing Conditions

The existing combined sewer systems in Ottawa conduct sewage flows and surface drainage to the Ottawa River, the outfalls being located downstream from the Chaudiere Falls and the municipal water works intakes.

The following sewage lift stations are incorporated in this system:

- Bronson Avenue(at Carleton University) - no overflow;
- Harvard Avenue - no overflow
- Forest Hill Road - overflow to Rideau River

The Carleton Heights Subdivision is served by a conventional activated sludge type treatment plant located on the west side of the Rideau River at Mooney's Bay. The plant was completed in 1947 and has a design capacity of 90,000 U.S. gpd. The effluent is chlorinated and discharged to the Rideau River. Engineering studies are being made in order to promote the treatment efficiency of this plant.

The Urbandale conventional activated sludge treatment plant was constructed in 1960 under OWRC Approval Certificate No.59-A-606. The plant is located in the south-eastern section of the city, at the junction of Walkely Road and the C.N.R. right-of-way. The design capacity of this plant is indicated as 800,000 gpd. The effluent is filtered and chlorinated prior to being discharged to Green Creek. This plant was built as a temporary measure to provide sewage treatment for the Urbandale Subdivision and it will be abandoned when the construction of Ottawa's Green Creek collector sewer is completed.

The R.C.A.F. Station at Uplands is served by a conventional activated sludge type treatment plant located on the east side of the Rideau River approximately one mile north of the station. The plant has a design capacity of 500,000 gpd and was constructed under Ontario Department of Health Approval Certificate No.51-A-391. The plant effluent is chlorinated and discharged to the Rideau River.

(b) Proposed Sewage Works

The sewage works construction program for the City of Ottawa includes the installation of collector, interceptor and outfall sewers which will conduct the sewage flows from the City of Ottawa, the City of Eastview, the Village of Rockcliffe Park, and that part of Gloucester Township lying inside the inner Green Belt boundary, to the water pollution control plant which is being constructed near the mouth of Green Creek.

The ultimate sewerage program should also include the areas presently served by the Uplands, Urbandale and Carleton Heights sewage treatment plants.

Sewage flows will reach Ottawa's water pollution control plant via the Green Creek collector sewer and the Ottawa River interceptor sewer. It is anticipated that construction of the Green Creek collector sewer will be completed during the autumn months of 1964. During these latter investigations in May, 1963, the Ottawa River interceptor sewer was conducting sewage flows to the water pollution control plant. Reportedly, the Ottawa River interceptor sewer will carry approximately two-thirds of the flow and the remainder will be conducted by the Green Creek collector sewer.

Water Pollution Control Plant

The construction of Ottawa's water pollution control plant is approaching completion. The plant is situated on part of Lot 15, Concession One, in the Township of Gloucester. This site is located on the bank of the Ottawa River, approximately 1.25 miles upstream from the mouth of Green Creek.

Approved by the Ontario Water Resources Commission as per Approval Certificates 60-A-127 and 61-A-270, the plant initially will provide primary treatment for an average daily flow of 25 million gallons, and the plant will be enlarged later to treat an average daily flow of 40 million gallons. An ultimate capacity of 75 million gallons is proposed with the plant converted to provide secondary treatment. These design flows correspond to populations of 257,000, 375,000 and 590,000.

The chlorinated effluent will be discharged to the Ottawa River. Sludge will be pumped to two-stage digesters, and the digested sludge will be stored in sludge lagoons prior to ultimate disposal.

It is anticipated that sewage treatment will be commenced at the W.P.C.P. by approximately June 15, 1963.

In order to complement the recent sampling program, samples were obtained on May 30, 1963, from the untreated sewage flows passing through the W.P.C.P. to the Ottawa River. The laboratory results pertaining to the samples collected from this outfall (0.121.9T) are shown in the tabulations for Gloucester Township and indicate the need for sewage treatment.

2. Industrial Waste Disposal

Industrial waste flows are discharged either directly to the Ottawa River or to the city sewer systems. Industrial waste disposal procedures are discussed in Part II.

3. Recreational Sites

The extensive use made of the Ottawa River and the Rideau River for recreational purposes within the City of Ottawa indicates the necessity for controlling pollution in these waters. The Rideau River has a vital function in the National Capital Commission's planning for the area, particularly with respect to the concept of driveways and parks. From Mooney's Bay to the

Ottawa River the banks of both the canal and the river are bordered with parklands.

Popular bathing beaches are located on these watercourses as follows:

Ottawa River:

Britannia Beach
Westboro Beach

Rideau River:

Mooney's Bay Beach
Brewer Beach
Brighton Beach
Brantwood Beach
Strathcona Beach
New Edinborough Beach

Water samples for bacteriological examination are collected at these beaches on a regular basis by City of Ottawa Health Department staff during the recreational season.

4. Surface Water Quality

The laboratory results pertaining to water samples collected from the Ottawa River at the City of Ottawa indicate that the sanitary chemical and bacteriological qualities of these waters deteriorate as they flow through the city. From sample point number 0.132.6 at the Champlain Bridge which is located upstream from the concentrated section of the city, to sample point number 0.123.4 which is located downstream from Kettle Island near the eastern city limit, the coliform content increased sharply. This adverse stream quality obviously results from sanitary and industrial waste flows gaining access to the watercourse either directly or via tributaries which empty into the Ottawa River in this vicinity.

The quality of the Urbandale S.T.P. effluent discharging to Green Creek beyond the city limit was within the objectives of the OWRC.

The sanitary chemical and bacteriological qualities of the waters in the Rideau River and Canal were generally satisfactory within the City of Ottawa although a high coliform content was revealed at sample point number R.11.0E which is located at Black Rapids locks near the upstream limit of the city. Appreciable increases in coliform content were indicated also at Billings Bridge and Hurdman Bridge. In reference to the treated effluents discharging to the Rideau River from two sewage treatment plants located within the city, a high 5-day BOD content was revealed in the Carleton Heights S.T.P. outfall (R.7.2T) while an excessive coliform content was evident in the R.C.A.F. - Uplands S.T.P. discharge(R.9.4T). The laboratory results suggest the presence of contaminants in the creek from Uplands Airport when sampled at Riverside Drive(RU.9.5).

During the recent sampling program it was evident that the sanitary chemical and bacteriological qualities of Pinecrest Creek were somewhat high as the watercourse entered the city (PE.2.4), but had improved at sample point number P.0.4 near the creek mouth.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

The present adequate capacity of Ottawa's water purification works, combined with the virtually unlimited water supply available in the Ottawa River, appears to preclude the necessity for recommendations at this time.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

In conjunction with the construction of the Green Creek collector sewer and the Ottawa River interceptor sewer, an intensive program will be necessary to ensure that all sewage flows now discharging from the city to watercourses will be diverted to the sanitary sewer system.

Industrial waste flows, if not acceptable to the municipal sanitary sewer system, should receive adequate treatment prior to their discharge to a watercourse.

Close supervision of sewage treatment processes is necessary at the Carleton Heights S.T.P. and the R.C.A.F. - Uplands S.T.P.

CITY OF EASTVIEW

I GENERAL

The City of Eastview is located east of the Rideau River and within the greater Ottawa area. The area of Eastview is 660 acres. The 1963 population approximates 25,105.

II WATER SUPPLY

The City of Eastview is served by water from the Ottawa municipal distribution system. There is no distribution storage or auxiliary pumping.

III WATER REQUIREMENTS FOR THE FUTURE

It is expected that the present arrangement with the City of Ottawa will be satisfactory for future water requirements.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Untreated sanitary wastes from Eastview flow by gravity through a system of combined sewers to a City of Ottawa sewer which, in the past, has discharged to the Ottawa River at the foot of John Street. The Ottawa River interceptor and outfall sewer will allow the discharging of these sewage flows to the City of Ottawa water pollution control plant which has been constructed near the mouth of Green Creek.

2. Industrial Waste Disposal

Industry in Eastview is secondary in nature with no large manufacturing enterprise. Industrial waste flows are discharged to the municipal sanitary sewer system.

3. Surface Water Quality

Since waste flows from Eastview are discharged to the Ottawa W.P.C.P., any effects exerted on surface water quality are discussed in the foregoing section of this report dealing with the City of Ottawa.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

Recommendations with respect to water development apparently are unnecessary at this time.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

The completion of the major sewage works construction project by the City of Ottawa should resolve the problem of untreated sewage flows from Eastview gaining access to the Ottawa River.

CITY OF OTTAWA - CITY OF EASTVIEW - VILLAGE OF ROCKCLIFFE PARK

Analyses of Stream and S.T.P. Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
0.123.4	Ottawa R.downstream from Kettle Island				
	A - at Ontario side	Aug.16/60	1.8	4	121,000
		Nov.7/61	2.8	2.6	6,800
		July 26/62	2.2	5.0	6,800
		May 27/63	2.0	2.9	17,200
	B - 1/4 distance across river	Nov.7/61	2.7	2.8	6,100
		May 27/63	2.8	3.3	20,400
	C - 1/2 distance across river	Aug.16/60	1.3	4	148,000
		Nov.7/61	2.7	2.3	9,800
		May 27/63	2.1	3.3	20,800
	D - 3/4 distance across river	Nov.7/61	2.8	2.6	3,700
		May 27/63	1.4	3.5	6,000
	E - at Quebec side	Aug.16/60	0.5	7	194,000
		Nov.7/61	37.0	9.5	15,400
		July 26/62	1.3	5.0	10,400
		May 27/63	15	4.0	182,000

CITY OF OTTAWA - CITY OF EASTVIEW - VILLAGE OF ROCKCLIFFE PARK

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
0.127.1	Ottawa River at Gatineau Point				
	A - 1/4 distance across river	Aug.16/60	1.9	6	141,000
		Nov.6/61	3.5	2.8	900
	phenols in ppb.- 6	May 29/63	2.2	2.6	95,000
	B - 1/2 distance across river	Aug.16/60	1.5	5	179,000
		Nov.6/61	3.6	2.3	2,000
	phenols in ppb.- 5	May 29/63	1.6	2.6	570
	C - 3/4 distance across river	Aug.16/60	1.2	6	180
		Nov.6/61	3.0	2.5	1,400
	phenols in ppb.- 4	May 29/63	1.6	2.6	115,000
0.129.0	Ottawa River at Interprovincial Bridge				
	A - 1/4 distance across river	Aug.16/60	2.0	4	270
		July 26/62	1.3	1.5	6,500
		May 29/63	1.8	2.6	9,700
	B - 1/2 distance across river	Aug.16/60	1.7	4	153,000
		Nov.6/61	3.6	2.8	14,400
		July 26/62	1.2	1.3	250,000
		May 29/63	2.3	2.6	19,000
	C - 3/4 distance across river	Aug.16/60	2.2	5	77,000
		July 26/62	1.8	1.1	--
		May 29/63	3.0	2.6	10,300

CITY OF OTTAWA - CITY OF EASTVIEW - VILLAGE OF ROCKCLIFFE PARK

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100ml.
0.130.2	Ottawa River at Chaudiere Bridge				
	A - 1/4 distance across river	May 29/63	1.2	2.6	110
	B - 1/2 distance across river	Nov.8/61	1.1	3.6	128
		May 29/63	1.2	2.6	220
	C - 3/4 distance across river	May 29/63	1.4	2.6	270
0.132.6	Ottawa River at Champlain Bridge				
	A - 1/4 distance across river	May 30/63	1.6	2.3	16
	B - 1/2 distance across river	Nov.8/61	2.0	3.3	12
		May 30/63	1.9	2.3	20
	C - 3/4 distance across river	May 30/63	1.7	2.3	14
GREEN CREEK					
G.7.5T	Urbandale S.T.P. outfall to Green Creek at city limit	May 28/63	3.3	Susp.solids- 2 Diss.solids- 488	2,200

CITY OF OTTAWA - CITY OF EASTVIEW - VILLAGE OF ROCKCLIFFE PARK

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
RIDEAU RIVER					
R.0.1	Rideau River at Sussex Ave.	Aug.17/60	1.8	4	320
		Nov.1/61	1.7	2.3	126
		Aug.27/62	1.4	4.0	150
		May 28/63	2.1	3.8	104
R.1.0	Rideau River at St.Patrick St.	Aug.17/60	1.3	5	840
		Nov.1/61	2.5	2.1	52
		May 28/63	2.1	3.5	142
R.1.5	Rideau River at Rideau St.	Aug.17/60	1.8	5	--
		Nov.1/61	5.0	2.5	58
		Aug.27/62	1.8	3.8	740
		May 28/63	2.2	3.5	200
R.2.7	Rideau River at Hurdman Bridge	Aug.17/60	1.1	4	370
		Nov.1/61	2.6	2.0	42
		May 28/63	1.8	3.3	6,800
R.5.1	Rideau River at Billings Bridge	Aug.17/60	1.5	4	540
		Nov.1/61	1.8	2.0	102
		Aug.27/62	2.0	4.0	320
		May 28/63	2.0	2.8	9,800
R.7.0	Rideau River at Hogs Back	Aug.17/60	2.2	4	340
		Nov.3/61	3.0	3.1	28
		Aug.27/62	-	-	1,100
		May 28/63	2.0	3.8	164

CITY OF OTTAWA - CITY OF EASTVIEW - VILLAGE OF ROCKCLIFFE PARK

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
RC.0.6	Rideau Canal at Wellington St.	May 28/63	4.0	3.5	28
RC.1.6	Rideau Canal at Pretoria Bridge	Aug.17/60	2.1	8	240
		May 28/63	3.5	3.5	14
RC.3.5	Rideau Canal at Bronson Ave.	Nov.3/61	2.8	4.5	28
		Aug.27/62	-	-	90
		May 28/63	4.4	6.0	12
RC.5.5	Rideau Canal at Hogs Back	Nov.1/61	2.2	2.5	50
		Aug.27/62	-	-	48,000
		May 28/63	2.4	5.5	112
R.7.2T	Carleton Heights S.T.P.outfall	May 28/63	60.	Susp.solids- 58	14
R.7.3	Rideau River upstream from Carleton Heights S.T.P.outfall	May 28/63	4.2	27	420
RU.9.5	Creek from Uplands Airport- at Riverside Drive	May 29/63	6.8	8	
R.9.4T	R.C.A.F. - Uplands S.T.P. outfall	May 29/63	7.2	Susp.solids- 27	241,000
R.11.0W	Rideau River at Black Rapids Locks W. side	Nov.3/61	2.8	2.6	16
		May 29/63	1.4	3.1	30
R.11.0E	Rideau River at Black Rapids Locks E. side	Nov.2/61	2.8	2.0	44
		May 29/63	1.5	3.1	11,000

CITY OF OTTAWA - CITY OF EASTVIEW - VILLAGE OF ROCKCLIFFE PARK

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
PINECREST CREEK					
P.O.4	Pinecrest Creek- at Hwy.15 (Richmond Rd.)	Aug.25/60	9.0	85	570
		May 28/63	5.6	8.5	1,000
PE.2.4	East Branch- at city limit	Aug.25/60	2.4	Susp.solids-46	780
		May 28/63	11.0	8.5	12,800
PW.2.4	West Branch- at city limit	Creek not exposed			

WATER RESOURCES SURVEY

- County of Carleton -

CHAPTER 7

- VILLAGES -

VILLAGE OF RICHMOND

I GENERAL

Richmond is located within the Township of Goulbourn and has an area of 1,590 acres. The 1963 population is approximately 1,239.

II WATER SUPPLY

Privately-owned dug and drilled wells supply the village residents with potable water. The drilled wells range in depth from 14 to 152 feet and have an average depth of 60 feet. They produce adequate supplies of water from the limestone bedrock at depths of 30 to 50 feet below the rock surface. The bedrock is probably more permeable at this horizon than at others. Several of the drilled wells flow at about 4 gpm, discharging into storm ditches tributary to the Jock River. The water from drilled wells in the area is fresh but quite hard. Reports of the occurrence of sulphurous water were received and sulphurous water was found in a well outside the village. Some dug wells were reported to provide inadequate supplies.

III WATER REQUIREMENTS FOR THE FUTURE

The capacities of most wells in the village are adequate for the present needs and appear to be sufficient for normal, future requirements. It also appears that sufficient supplies of potable ground water could be found for normal future growth.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Sewage disposal within the village is effected on individual premises. Septic tanks and associated tile bed systems are installed under the supervision of the Gloucester-Nepean Health Unit staff. Reportedly, these installations function adequately with no incidence of ground water pollution being apparent.

No plans have been made for the development of a municipal sewage treatment works.

An extended aeration sewage treatment plant serving the South Carleton District High School includes works which provide effluent sand filtration and chlorination prior to discharge to the Jock River. Upstream from Richmond, summer flow in the Jock River is negligible.

2. Industrial Waste Disposal

No industry is located in the village.

3. Surface Water Quality

The pertinent laboratory results indicate that the sanitary chemical quality of the Jock River water does not deteriorate appreciably as the watercourse flows through Richmond.

The bacteriological quality of the effluent discharged from the South Carleton District High School sewage treatment plant is excessive. It is apparent that effluent chlorination procedures should receive more supervision.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that individual well installations continue to supply the needs of the villagers. If, in the future, a communal supply system is considered, a test-drilling program should be undertaken to locate a well site or sites to supply the village. Any future municipal test holes or private wells that encounter sulphurous water should be sealed to prevent contamination of the fresh water horizons in higher portions of the bedrock.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Local officials should ensure that private sewage disposal systems will continue to function adequately, and that connections to local watercourses or surface water drainage systems will not be permitted.

Efficient operation of the sewage treatment plant serving the South Carleton District High School is necessary.

VILLAGE OF RICHMOND

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
RJ.26.3	Jock River at E. limit of village	May 28/63	1.6	2.5	1,300
RJ.26.9T	South Carleton District High School S.T.P. outfall	May 28/63	9.4	Susp.solids- 30	124,000
RJ.27.4	Jock River at S. limit of village	Nov.2/61	2.2	2.0	128
		May 28/63	1.5	1.1	104

VILLAGE OF ROCKCLIFFE PARK

I GENERAL

This village is located north of Eastview and borders the Ottawa River. The area of the municipality is 368 acres. The population in 1963 approximates 2,289.

II WATER SUPPLY

1. Source

The City of Ottawa provides water to Rockcliffe Park. The supply is received at five metered points around the periphery of the village.

2. Distribution

The village has no storage facilities. A pressure booster station is incorporated in the system.

III WATER REQUIREMENTS FOR THE FUTURE

It is anticipated that the agreement with the City of Ottawa will be satisfactory for future requirements.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Approximately 75 per cent of the village is sewered, with the remainder utilizing septic tank systems. In the past, untreated sewage flows from this residential area have discharged either through two local sewer outlets to the Ottawa River, or into the City of Ottawa's combined sewer system and thence to the river. These discharges are now being diverted to the Ottawa River interceptor sewer and the W.P.C.P.

2. Industrial Waste Disposal

The village is strictly a residential area and no industrial activities are permitted. Therefore, industrial waste disposal is not a problem.

3. Surface Water Quality

Due to the location of Rockcliffe Park in close proximity to Ottawa and Eastview, it has been necessary to combine the respective laboratory results pertaining to stream samples. Therefore, surface water quality has been discussed previously in the section on the City of Ottawa.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

The future water requirements of the village will be somewhat limited due to certain restrictions on development in the area. With the enlargement of the Ottawa water purification plant capacity, an adequate supply of water for the village appears to be ensured.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Since sewage flows from Rockcliffe Park will be discharged to the City of Ottawa water pollution control plant, this arrangement appears to exclude the necessity for other recommendations at this time.

VILLAGE OF STITTSVILLE

I GENERAL

Stittsville is situated approximately eight miles south-west of the City of Ottawa. The area and population of this village are approximately 805 acres and 1,572 persons, respectively.

II WATER SUPPLY

Privately-owned dug and drilled wells supply the residents of Stittsville with adequate potable water. The greatest number of private wells are drilled to depths of about 70 feet and produce water from the limestone bedrock. The water is usually hard. Some cases of a high iron content were reported and, during a recent survey of ground water conditions in the village, several of the deepest wells were found to produce sulphurous water; however, sulphurous water is not a widespread problem.

III WATER REQUIREMENTS FOR THE FUTURE

Ground water resources appear to be adequate to handle normal domestic requirements for the future. If a communal water supply system were to be considered, there appears to be a good possibility that a well site or sites capable of supplying adequate water from the bedrock or perhaps the overburden could be found in or near the village to supply such a system.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private sewage disposal systems are utilized in Stittsville. The recent inclusion of this village in the Gloucester-Nepean Health Unit will provide supervision of the installation of private sewage disposal systems. Malfunctioning septic tank systems have been reported in the past at some locations.

2. Industrial Waste Disposal

Since Stittsville is primarily a residential village, industrial activity has not become important.

3. Surface Water Quality

Water samples were obtained from Stittsville Creek at the upstream and downstream limits of the village. The pertinent laboratory results indicate satisfactory conditions at both locations with respect to sanitary chemical and bacteriological qualities.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

If ground water is considered as a source of supply for a proposed municipal system, it is recommended that a test-drilling program be undertaken to determine the location or locations of sufficient supplies of good quality water. In the event that large supplies of sulphurous water were encountered, consideration should be given to treatment to render it potable.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

The sewage works program for the proposed urban development in the north-east corner of Goulbourn Township should provide capacity to include the sewage flow from Stittsville. The provision of separate sewage works for Stittsville should not be considered since the only receiving stream in the area is a small tributary of the Carp River and sufficient dilution is not afforded by this watercourse.

VILLAGE OF STITTSVILLE

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
CS.28.0	Stittsville Creek at downstream limit of village	May 29/63	1.6	Susp.solids- 6	178
CS.29.0	Stittsville Creek at upstream limit of village	May 29/63	2.4	Susp.solids- 6	230

WATER RESOURCES SURVEY

- County of Carleton -

CHAPTER 8

- TOWNSHIPS -

TOWNSHIP OF FITZROY

I GENERAL

The Township of Fitzroy is located in the north-western corner of the county and has a population of approximately 2,192.

II WATER SUPPLY

Throughout Fitzroy Township water supplies are obtained from privately-owned dug and drilled wells. It has been estimated that up to 40 per cent of these wells are dug and it is reported that they yield adequate supplies of water. The drilled wells range in depth from 40 to 516 feet and generally produce adequate supplies of potable water from the bedrock. There are a few drilled wells north-west of Antrim that are reported to produce salty and sulphurous water from the limestone bedrock which is the Ottawa formation.

The domestic water supply for the Hydro Electric Power Commission installation at Chats Falls comes from a drilled well 52 feet deep. Water from this well also supplies a small community of 17 houses associated with the power plant. The supply is not chlorinated.

Two cheese factories obtain water for heating, cooling, and washing purposes from flowing drilled wells.

III WATER REQUIREMENTS FOR THE FUTURE

The population of the township is expected to remain static and it is unlikely that there will be much heavy demand for water supplies in the future. Individual privately-owned dug and drilled wells will likely be able to supply all normal future requirements. From a study of the available water-well records, potential supplies of water for domestic purposes appear to be available from the bedrock throughout the township but in the northern parts of ConcessionsI to IV, deep drilling may encounter sulphurous or salty water. There is a possibility that, with good methods of well construction, overburden wells could be developed in sand and gravel deposits that occur around Kinburn and to the north-west.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private sewage disposal systems are employed throughout the township.

The H.E.P.C. development at Chats Falls is served by a septic tank with the chlorinated effluent being discharged to a tributary of the Ottawa River.

2. Industrial Waste Disposal

Three cheese factories are located within the township, two of which have industrial waste disposal problems.

The Fitzroy Harbour Cheese Factory is located in Concession X, Lot 20. Waste waters are discharged directly to the Carp River.

Ownership of this plant has changed recently and the cheese factory was not in operation during the recent investigations.

The Kinburn Cheese and Butter Association plant is located in Concession VII Lot 12. Untreated industrial wastes are discharged to the Carp River. The pertinent laboratory results indicate that this waste should be excluded from the watercourse.

The Diamond Cheese Company Limited plant is located in Concession IX, approximately two miles north-east of Kinburn. Industrial waste exclusive of whey is discharged to a ditch. This site is relatively remote from a watercourse.

3. Surface Water Quality

The laboratory results indicate that the sanitary chemical and bacteriological qualities of the Ottawa River water are satisfactory as this watercourse flows past Fitzroy Township.

Similar conditions were revealed in that section of the Carp River which flows through the township. The Fitzroy Harbour Cheese Factory and the Kinburn Cheese Factory normally discharge industrial waste flows to the Carp River. There was no discharge from the former plant during the recent sampling program. Samples were obtained from the Kinburn Cheese Factory outfall on May 28, 1963, and the pertinent laboratory results reveal an excessive 5-day BOD content.

The sanitary chemical and bacteriological qualities of the Mississippi River and its tributaries within the township were satisfactory. The high coliform content revealed in the river near its mouth in 1962 was not evident during the recent period of sampling.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that ground water continue to be used as the source of water supply for domestic purposes. Detailed ground water surveys and test-drilling programs should be undertaken in any areas where subdivision or commercial developments are considered in the future to establish the quantity of water available.

Drilling to depths greater than 60 feet into the limestones of the Ottawa formation is not recommended because of the risk of encountering salty or sulphurous water.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Industrial waste disposal procedures employed at the Fitzroy Harbour Cheese Factory and the Kinburn Cheese Factory should be effectively revised in order to exclude the plant discharges from the Carp River.

TOWNSHIP OF FITZROY

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	OTTAWA RIVER				
0.160.6	Ottawa River at Moore Landing-Quyon				
	A - 1/3 of distance across river	May 29/63	1.4	Susp.solids- 4	96
	B - 2/3 of distance across river	May 29/63	1.3	Susp.solids- 9	290
0.163.6	Ottawa River at Chats Falls Generating Station	Aug.10/60	1.8	4	370
		Nov.7/61	2.2	2.3	0
		May 29/63	1.5	Susp.solids- 2	170
	CARP RIVER				
C.0.1	Carp River at end of road near mouth	Aug.24/60	3.6	11	100
		Nov.7/61	2.5	2.0	0
		May 28/63	1.4	2.6	140
C.1.2	Carp River at Bridge N.E. of Fitzroy Harbour	Aug.24/60	2.7	10	40
		May 28/63	1.3	1.8	17
C.2.5I	Outlet from Fitzroy Harbour Cheese Factory- no discharge on May 28/63		--	--	--
C.7.7I	Outlet from Kinburn Cheese Factory	May 28/63	1750	Susp.solids- 750	less than 10
C.8.6	Carp River at Bridge 0.5 miles N.W. of Kinburn	Aug.24/60	11	8	60,000
		May 28/63	1.7	4	29

TOWNSHIP OF FITZROY

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
CARP RIVER					
C.14.4	Carp River at Fitzroy-Huntley Boundary	May 28/63	1.9	8.0	64
MISSISSIPPI RIVER					
M.0.4	Mississippi River at N.end of road from Galetta	Aug.24/60	1.6	6	70
		Aug.28/62	1.1	2.1	12,300
		May 28/63	1.3	3.5	118
M.1.1	Mississippi River at R.R.Bridge upstream from Galetta	Aug.24/60	1.5	7	130
		Nov.7/61	2.4	2.3	0
		May 28/63	1.4	3.1	124
M.3.7	Mississippi River at Hwy.17	Aug.24/60	1.1	5	300
		Aug.28/62	-	-	62
		May 28/63	1.4	2.9	142
MC.6.9	Cody Creek at first side road upstream from confluence	Aug.24/60	3.2	31	480
		May 28/63	1.5	11.5	580
MC.12.1	Cody Creek at Fitzroy-Huntley Boundary	Aug.24/60	2.4	21	830
		May 28/63	1.5	10	2,200
M.7.0	Mississippi River at Carleton-Lanark Boundary	May 28/63	1.6	2.8	208

TOWNSHIP OF GLOUCESTER

I GENERAL

Gloucester Township occupies the north-eastern corner of Carleton County and lies adjacent to the City of Ottawa. The Police Village of Orleans and part of the Police Village of Manotick are located within this municipality. For the purpose of this report, Manotick is discussed in the section dealing with the Township of North Gower.

During the past decade the population of the township has almost tripled, having increased from 6,297 in 1953 to 18,378 in 1963.

II WATER SUPPLY

All residents of the township obtain water supplies from dug and drilled wells. The dug wells generally are not reliable sources of supply, particularly during summer periods; however, dug wells in areas of sandy overburden, especially those in the south-western part of the township, usually produce sufficient quantities of potable water for private use. Contamination of some dug wells is reported to exist at Orleans and Cyrville.

Drilled wells generally provide dependable supplies of water although in some areas the water quality is poor. North-east of the Gloucester Fault, sulphurous or salty water is usually encountered from the Eastview, Billings, and Carlsbad formations. Some wells produce salty water from gravel horizons that underlie considerable thicknesses of marine clay in buried valleys. Good supplies of potable water are obtained from drilled wells along the Rideau River from Uplands Airport southward to the township boundary, in the vicinities of Johnston Corners and South Gloucester, and in some areas north of the Trans-Canada Highway north and west of Orleans. Recent test drilling near Orleans has indicated the availability of enough water to supply the Police Village of Orleans and some of the proposed surrounding water area.

There are many flowing wells in the township. Those south of Blackburn and north of Leitrim along the Gloucester Fault produce mineralized water. The mineralized water from Carlsbad Springs has had an interesting history of use for its purported health-giving properties.

Federal government installations at Leitrim, Orleans, and South Gloucester rely on drilled wells for their water supply. Hillside Gardens Subdivision near Manotick has a satisfactory communal distribution system supplied by one, 76 gpm, deep well. Another subdivision, Cardinal Heights, south of the Montreal Road and east of Skead Road, is supplied by a well system operated by the township. Recent test drilling has increased the amount of water available for domestic purposes at this subdivision.

III WATER REQUIREMENTS FOR THE FUTURE

As the population increases in those parts of the township near the city boundary or within planned developments in the Green Belt, it will be necessary to find an adequate communal supply of water for them.

For purposes of this discussion, it is convenient to divide the Township of Gloucester into three areas; namely, the inner urban area or that portion of the township bounded by the city limits and the inner limits of the Green Belt, the area within the Green Belt, and the area beyond the outer limits of the Green Belt. These areas are defined by the National Capital Commission.

In the inner urban area existing water supplies are jeopardized by unsatisfactory quality and insufficient quantity. It is anticipated that the density of population within the inner urban area will approximate 15 persons per acre. With such a density on an area of 4,500 acres, a population of 67,000 persons may be expected. It appears that present ground water resources are inadequate to supply this population.

Within the inner urban area, city water appears to be the most feasible source of supply. At present, the City of Ottawa has sufficient supply capacity to meet present and future needs; however, the city lacks the necessary trunk watermain and the township lacks the distribution system.

In those areas of the Green Belt north-east of the Gloucester Fault, adequate potable supplies of ground water are difficult to find; however, as ground water appears to be the only available source of supply it will be necessary to conduct careful ground water studies in order to find as much ground water of suitable quality and sufficient quantity as is possible. In that part of the Green Belt near Uplands Airport, there is an excellent possibility that high capacity wells can be developed in the sandy overburden. It is unlikely that the City of Ottawa will extend its distribution system to supply the Green Belt area; however, the township distribution systems would be able to carry water from the city supply to areas of the township within the Green Belt where no other sources of water supply are available.

In the areas beyond the Green Belt, where growth trends and future water requirements are not so well defined, ground water supplies are likely to be adequate with respect to quantity to meet ordinary rural requirements. In certain areas, however, problems of water quality may be encountered. Ground water studies will be necessary in these areas to determine water quality and quantity in the event that high capacity wells are needed.

IV WATER POLLUTION

1. Sanitary Waste Disposal

(a) Existing Sewage Works

Private sewage disposal systems are in general use throughout the township. Septic tank installations are common. Private installations are actively controlled by officials of the Gloucester-Nepean Health Unit.

Occurrences of clay and heavy soils in the vicinity of Cyrville and in some areas lying near the Ottawa River make the use of septic tank systems on small building lots hazardous to the safety of ground water supplies.

In that part of the Police Village of Manotick which lies within Gloucester Township, private methods of sewage disposal are employed. In some instances untreated sewage flows are discharged to storm drainage systems and thence to the Rideau River.

There is one sewage treatment plant located in the township, being a small activated sludge treatment plant which serves H.M.C.S.Gloucester. This plant was designed for a daily sewage flow of 35,000 U.S. gallons. The chlorinated effluent is discharged to a ditch which extends to a tributary of the Castor River.

There are two Department of National Defence installations in the township, each employing septic tanks for sewage treatment. The Ottawa Wireless Station at Leitrim is served by a septic tank and tile bed system. The Army Vehicle Proving Grounds discharges a chlorinated septic tank effluent to an adjacent swamp.

(b) Future Sewage Works

Sewage works for the Police Village of Manotick and Orleans should be taken into consideration in the planning of these respective areas.

The areas of the township lying inside the Green Belt will be served by the Ottawa trunk sewer system. Most of the sewage flows will be received by the Green Creek collector sewer, with approximately 5,000 acres in the township to be served by that sewer.

As a temporary measure, chlorinated septic tank effluent will be discharged to Green Creek from the Gloucester High School which presently is being constructed east of the City of Ottawa near the intersection of Blair Road and Ogilvie Road. These flows will ultimately be discharged to the Green Creek collector sewer.

The sanitary sewage from the north-eastern part of the township, including the Police Village of Orleans, should be directed to the sewage treatment plant proposed for Cumberland Township at the county boundary.

Trunk sewers from the southern portion of the township should be designed to serve all of the Police Village of Manotick whether or not that community is prepared to utilize such a sewer immediately. Any project for the community should include the complete built-up area(including Long Island). The need is obvious for a joint program involving the four townships which abut at Manotick.

The OWRC is presently reviewing a proposal for the construction of a sewage treatment plant to serve Gloucester Township east of the Rideau River and south of the Green Belt. The suggested location of this plant is near the confluence of Mosquito Creek and the Rideau River. The possible sewer area would also include parts of Nepean, Osgoode and North Gower Townships.

In view of the other areas presently under consideration for development, it is deemed that water and sewage works proposals should be prohibited in the south-eastern part of the township.

2. Industrial Waste Disposal

Industry within the township is limited in extent.

The Crabtree Slaughterhouse is located on Lot 14, Concession III, and is engaged in the slaughtering of horses for dog food. All wastes are discharged to a septic tank system of reported adequacy.

3. Surface Water Quality

Laboratory results pertaining to water samples collected from the Ottawa River along the front of Gloucester Township during the past three years are appended and indicate the adverse bacteriological quality thereof. With the exception of the high coliform content which was present in the untreated effluent from the City of Ottawa W.P.C.P., and the high coliform concentrations present in the waters of Green Creek at its mouth, it is obvious that the adverse bacteriological quality of the Ottawa River in this area can be attributed to wastes discharged thereto upstream from the township.

Slight bacterial pollution was detected in the west branch of Bilberry Creek at Highway 17.

High coliform contents were revealed in the waters of Green Creek at its mouth where flows are sluggish, at Ridge Road, and upstream from the junction with McEwen Creek. The quality of the Urbandale S.T.P. effluent was satisfactory according to the results of the analyses performed on samples collected therefrom on May 28, 1963.

The sanitary chemical quality of the Rideau River water was generally satisfactory as the stream pursued its northerly course along the western border of Gloucester Township. Of exception were high coliform contents revealed at Black Rapids locks and immediately downstream from the mouth of Mosquito Creek.

The laboratory results suggest that the bacteriological qualities of Bear Brook and Edwards Creek have improved during the past three years.

The treated effluent from the H.M.C.S.Gloucester S.T.P. gains access to a tributary of the North Castor River within the Township of Osgoode(at sample point number NR.63.1T) although this Department of National Defence installation is located in Gloucester Township. A high BOD of 21 ppm. was revealed in this diluted waste where it was discharging to the watercourse.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that water from the City of Ottawa be used to supply the water needs of the inner urban area. It will be necessary for the township to negotiate for the city supply and construct a distribution system to service the area if negotiations are successful.

It is recommended that careful consideration be given to the establishment of an adequate water supply for those areas within the Green Belt where planned development is anticipated or where such development is being carried out at the present time. If ground water is to be sought as the source of supply, ground water surveys and test drilling programs should be undertaken. It may be necessary in some of these areas to consider programs of water treatment to improve the quality of the water. In areas where it is not possible to obtain ground water to service planned developments, an extension of the township distribution system to these areas will be necessary.

For those areas outside the Green Belt, it is recommended that ground water be used to supply all future requirements wherever possible. Ground water surveys and test-drilling programs will be necessary to determine the quality and quantity of the ground water supplies to be used for any proposed commercial or subdivision development.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

The imminent use of sewage treatment facilities at the City of Ottawa W.P.C.P. in Gloucester Township should reduce the extent of pollution in the local section of the Ottawa River.

Effective supervision of the H.M.C.S. Gloucester S.T.P. should be maintained.

POLICE VILLAGE OF ORLEANS

This community is located near the county boundary in the north-eastern part of Gloucester Township and has a population of 1,398. The area is drained by a branch of Bilberry Creek which flows in a northerly direction to the Ottawa River.

Water supplies are obtained from ground water sources.

Private sewage disposal systems are used at Orleans. The reported occurrences of malfunctioning septic tank systems is attributed, in part, to the limited areas of some building lots as well as the poor absorption characteristics of the soil.

TOWNSHIP OF GLOUCESTER

Analyses of Stream and Sewage Works Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	OTTAWA RIVER				
0.117.9	Ottawa River at Carleton-Russell Boundary				
	A - 1/4 of distance across river - phenols in ppb. - 13	May 29/63	1.9	3.3	24,300
	B - 1/2 of distance across river - phenols in ppb. - 11	May 29/63	2.0	3.5	12,300
	C - 3/4 of distance across river - phenols in ppb. - 12	May 29/63	2.1	3.5	9,200
0.120.3	Ottawa River downstream from mouth of Green Creek				
	A - 1/4 of distance across river	Nov.7/61 May 29/63	7.2 2.3	5.5 3.5	18,600 13,600
	B - 1/2 of distance across river	Nov.7/61 May 29/63	3.1 2.3	2.6 3.3	20,400 17,400
	C - 3/4 of distance across river	Nov.7/61 May 29/63	12.0 2.2	3.5 1.1	17,100 9,700
0.121.0	Ottawa River downstream from Lower Duck Island				
	A - 1/5 of distance across river	May 29/63	2.4	3.5	23,900
	B - 2/5 of distance across river	May 29/63	1.9	3.5	14,300
	C - 3/5 of distance across river	May 29/63	1.7	3.3	15,100
	D - 4/5 of distance across river	May 29/63	1.5	2.3	5,700
0.121.9T	City of Ottawa Water Pollution Control Plant outfall	May 30/63	106	Susp.solids- 116	219,000,000

TOWNSHIP OF GLOUCESTER

Analyses of Stream and Sewage Works Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
0.123.4	Ottawa River downstream from Kettle Island(city limits				
	A - at Ontario side	Aug.16/60	1.8	4	121,000
		Nov.7/61	2.8	2.6	6,800
		July 26/62	2.2	5.0	6,800
		May 29/63	2.0	2.9	17,200
	B - 1/4 distance across river	Nov.7/61	2.7	2.8	6,100
		May 29/63	2.8	3.3	20,400
	C - 1/2 distance across river	Aug.16/60	1.3	4	148,000
		Nov.7/61	2.7	2.3	9,800
		May 29/63	2.1	3.3	20,800
	D - 3/4 distance across river	Nov.7/61	2.8	2.6	3,700
		May 29/63	1.4	3.5	6,000
	E - at Quebec side	Aug.16/60	0.5	7	194,000
		Nov.7/61	37.0	9.5	15,400
		July 26/62	1.3	5.0	10,400
		May 29/63	15	4.0	182,000
BILBERRY CREEK					
BY.0.1	Bilberry Creek near mouth	NOT SAMPLED	--	--	--
BYW.1.3	West Branch at Hwy.17(north route)	May 28/63	3.3	12.5	6,800
BYE.1.1	East Branch at Hwy.17(north route)	May 28/63	2.2	53	830

TOWNSHIP OF GLOUCESTER

Analyses of Stream and Sewage Works Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	GREEN CREEK				
G.0.1	Green Creek near mouth	Aug.25/60	2.3	--	56,000
		Nov.7/61	6.2	5.5	8,900
		July 26/62	1.2	1.4	6,500
		May 29/63	3.4	53	50,000
GE.1.8	East Branch at Hwy.17(N.Route)	May 28/63	1.8	21	970
G.2.4	Green Creek at Hwy.17	Aug.25/60	3.6	--	80
		May 28/63	2.7	23	920
G.4.9	Green Creek at Innes Rd.	Aug.25/60	2.2	10	160
		May 28/63	4.2	11	1,070
G.7.5T	Urbandale S.T.P. outfall to Creek(plant located in Ottawa)	May 28/63	3.3	Susp.solids- 2	2,200
G.8.0	Green Creek at Ridge Rd.	Aug.30/60	5.2	73	20,000
		May 28/63	4.6	53	510
GX.8.8	McEwen Creek upstream from confluence with Green Creek	May 28/63	1.7	10	770
G.8.9	Green Creek at road upstream from junction with McEwen Creek	May 30/63	2.4	27	95,000

TOWNSHIP OF GLOUCESTER

Analyses of Stream and Sewage Works Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
R.11.0.W	Rideau River at Black Rapids Locks - W. side	Aug.11/60	0.7	2.0	70
		Nov.3/61	2.8	2.6	16
		May 29/63	1.4	3.1	30
R.11.0.E.	Rideau River at Black Rapids Locks - E. side	Nov.2/61	2.8	2.0	44
		May 29/63	1.5	3.1	11,000
R.13.1	Rideau River downstream from mouth of Mosquito Creek	May 29/63	1.7	2.6	23,000
RMO.13.3	Mosquito Creek near mouth	May 29/63	1.5	3.5	170
R.13.3	Rideau River upstream from mouth of Mosquito Creek	May 29/63	1.6	4.0	130
R.14.9	Rideau River downstream from Carleton Lodge S.T.P. outfall	May 29/63	1.5	4.0	240
R.15.1	Rideau River upstream from Carleton Lodge S.T.P. outfall	May 29/63	1.6	4.0	190
RE.17.8	Rideau River at Manotick Bridge- E.side - just upstream from Twp. boundary	Aug.22/60	1.3	4.0	20
		Nov.2/61	2.2	2.3	28
		Aug.27/62	-	-	170
		May 29/63	1.5	2.3	50

TOWNSHIP OF GLOUCESTER

Analyses of Stream and Sewage Works Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	SOUTH NATION RIVER				
NB.54.7	Bear Brook at County Boundary E. of Carlsbad Springs	Aug.30/60	6.4	33	20,000
		May 27/63	2.2	26	660
NBE.57.8	Edwards Creek at Con.Rd.8	Aug.30/60	5.6	49	50,000
		May 27/63	1.6	23	220
NB.56.6	Bear Brook at diagonal road upstream from junction with Edwards Creek	Aug.30/60	4.0	27	120,000
		May 27/63	4.0	27	36
NR.63.1T	H.M.C.S. Gloucester S.T.P. outfall to North Castor River	May 27/63	21.0	16	800

TOWNSHIP OF GOULBOURN

I GENERAL

This predominantly rural township has experienced a gradual increase in population during the past decade. From a population of 1,968 in 1953 there has been an increase to 2,157 in 1963. This latter figure is somewhat distorted due to the recent incorporation of Stittsville as a village. Including the Village of Stittsville, therefore, the present township population would have been 3,729. The rapid growth is due, in part, to the residential development of the Stittsville area.

II WATER SUPPLY

All residents of Goulbourn Township obtain water from dug and drilled wells. It is estimated that about 90 per cent of the wells in the township are drilled. These wells extend into the limestone bedrock and have an average depth of less than 100 feet. Some of the wells west of Stittsville and at Richmond flow. Sulphurous water is reported in some wells in Concessions VIII, IX and XII. A trailer camp in Lot 26, Concession XII, uses a well supply for several mobile homes.

III WATER REQUIREMENTS FOR THE FUTURE

Extensive urban development is proposed for the north-eastern part of the township near Hazeldean. Test-drilling in the area has indicated the availability of adequate, potable supplies of ground water. Additional supplies for rural areas in the township can probably be obtained from drilled wells.

IV WATER POLLUTION

1. Sanitary Waste Disposal

(a) Existing Conditions

Private septic tank systems are used extensively throughout the township.

(b) Future Sewage Works

The aforementioned proposed urban development near Hazeldean is to be served ultimately by a trunk sanitary sewer to the Nepean W.P.C.P. Such a sewer also will serve areas in March and Nepean Townships. Temporary sewage disposal will have to be provided by lagoons designed for total retention.

2. Industrial Waste Disposal

No industries are located within the township.

3. Surface Water Quality

The laboratory results pertaining to the Carp River and Stittsville Creek indicate satisfactory conditions with respect to sanitary chemical and bacteriological qualities. No explanation is readily available for the relatively high coliform content revealed in the Carp River(sample point number C.28.9) at the Goulbourn-Nepean boundary.

Satisfactory conditions were revealed also in those tributaries of the Rideau River which drain Goulbourn Township. These are the Jock River, Mansfield Creek and King Creek.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

If ground water is to be used as a source of water supply for communal systems, surveys and test-drilling programs should be undertaken. It appears likely that sufficient ground water supplies will be available, especially in areas where the Nepean sandstone formation is present at or near the bedrock surface.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Sewage works for the township should be a joint program with March and Nepean Townships. Sewerage for the north-eastern part of the municipality should include provision, with respect to capacity, for serving the Village of Stittsville.

TOWNSHIP OF GOULBOURN

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
CARP RIVER					
CS.27.3	Stittsville Creek at Hwy.15	May 29/63	1.7	Susp.solids- 5	420
CS.28.0	Stittsville Creek at downstream limit of Stittsville	May 29/63	1.6	Susp.solids- 6	178
CS.29.0	Stittsville Creek at upstream limit of Stittsville	May 29/63	2.4	Susp.solids- 6	230
C.27.5	Carp River at Hwy.15	May 29/63	2.4	Susp.solids- 9	120
C.28.9	Carp River at Goulbourn-Nepean Boundary	May 29/63	1.5	Susp.solids- 19	8,000
RIDEAU RIVER					
RJ.25.7	Jock River at Goulbourn-Nepean Boundary	Aug.18/60	2.3	2	170
		Nov.2/61	2.5	3.8	66
		May 28/63	1.5	2.3	620
RJM.25.9	Mansfield Creek at Richmond Rd.	May 28/63	2.8	23	1,200
RJ.26.3	Jock River at E.limit- Village of Richmond	May 28/63	1.6	2.5	1,300
RJ.27.4	Jock River at S. limit- Village of Richmond	Nov.2/61	2.2	2.0	128
		May 28/63	1.5	1.1	104
RJ.35.7	Jock River at Richmond-Dwyer Hill Rd.	May 28/63	1.8	2.6	168
RJ.40.8	Jock River near Lanark-Carleton Boundary	May 28/63	1.6	0.8	900
RJK.36.0	King Creek at Dwyer Hill Rd.	May 28/63	2.5	1.8	198

TOWNSHIP OF NORTH GOWER

I GENERAL

Population growth in this municipality has been gradual but slow. A population increase from 1,969 in 1953 to 2,574 in 1963 indicates a 30 per cent growth during the past decade. Some permanent and seasonal residential development has occurred along the Rideau River south of Manotick.

Police villages located in this township are North Gower and part of Manotick.

II WATER SUPPLY

All supplies of water are obtained from dug and drilled wells. Many dug wells are in use but some have had to be abandoned or deepened. Drilled wells have an average depth of about 80 feet and usually produce water from the limestone bedrock. A few drilled wells produce water from sand and gravel along the Rideau River south of Manotick and near Kars. Several new developments of summer homes have been built along the river south of Manotick and water for them is obtained from privately-owned dug and drilled wells. In the Fairmile Subdivision in Lot 42, Concession IV, two or three community wells supply fifty cottage lots.

The Police Villages of Manotick and North Gower obtain water supplies from privately-owned dug and drilled wells. It appears that well supplies in both of these villages are adequate to meet present demands.

III WATER REQUIREMENTS FOR THE FUTURE

It is probable that adequate supplies of potable ground water could be obtained to serve any communal systems which might be contemplated in conjunction with future developments within the township.

In the Police Village of North Gower, it appears that existing ground water supplies will be adequate to supply the needs.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private sewage disposal systems are in use throughout the municipality and appear to function adequately. The use of these systems in conjunction with private wells indicates the necessity for close supervision of sub-surface sewage disposal installations.

2. Industrial Waste Disposal

No industrial activity has been reported within the township.

3. Surface Water Quality

The watercourses of concern to this township are the Rideau River and one of its tributaries, namely Steven Creek. The sanitary chemical and bacteriological qualities of these waters as they pertain to this municipality were satisfactory. High coliform contents had been evident in Steven Creek during 1960 but were not evident during the recent sampling program.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that ground water supplies be developed as far as possible to satisfy any future growth. Ground water surveys and test-drilling programs should be undertaken to establish sources of water for any proposed communal distribution systems.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Strict control should be exercised with respect to development along the Rideau River to ensure that surface or ground waters will not be polluted by wastes from septic tanks or privies.

Any extensive development in this township should proceed only in conjunction with sewerage proposals for the Townships of Gloucester and Nepean. Such planning would restrict development to the north-eastern part of the municipality.

POLICE VILLAGE OF MANOTICK

Manotick is located in parts of three townships with the population distribution shown as follows:

Gloucester- 368
North Gower - 361
Osgoode- 110

The area of Manotick approximates 540 acres.

Water supplies are obtained on a private basis from dug and drilled wells. Although it is apparent that ground water supplies will be adequate for future use it is conceivable that, if water shortages should occur, consideration should be given to a communal water supply obtained from ground sources. The Rideau River is a potential source of water supply for Manotick but, since this procedure likely would entail the construction of extensive purification works, any development for the police village should rely on ground water as the source of supply.

Sewage disposal is effected on a private basis. It has been reported in the past that some private sanitary facilities have been connected to an Ontario Department of Highways storm sewer which extends to the Rideau River. All untreated or inadequately treated sanitary wastes should be excluded from the watercourse.

Extensive future development at Manotick might necessitate the provision of sewage collection and treatment works. The ultimate method of effluent disposal would require careful consideration.

POLICE VILLAGE OF NORTH GOWER

The population of this police village approximates 385.

Water supplies are obtained from dug and drilled wells. It is probable that these supplies will be adequate for future requirements.

Septic tank systems are utilized on a private basis and reportedly function adequately. Vigilance should be maintained to ensure that untreated or inadequately treated sewage flows do not gain access to Steven Creek, the local tributary of the Rideau River.

TOWNSHIP OF NORTH GOWER

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	RIDEAU RIVER				
RE.17.8	Rideau River at Manotick Bridge E. channel	Aug.22/60	1.3	4	20
		Nov.2/61	2.2	2.3	28
		Aug.27/62	-	-	170
		May 29/63	1.5	2.3	50
RW.18.2	Rideau River at Manotick Bridge W. channel	Aug.22/60	1.9	4	600
		Nov.3/61	2.2	2.3	6
		Aug.27/62	-	-	430
		May 29/63	2.1	2.3	98
R.23.7	Rideau River at new Kars Bridge	Nov.1/61	1.9	1.8	2
		Aug.27/62	-	-	110
		May 27/63	3.5	1.8	2
RS.25.6	Steven Creek at bridge just upstream from confluence	Aug.22/60	2.9	4	70,000
		May 27/63	1.7	3.1	20
RS.30.3	Steven Creek downstream from P.V. of N.Gower	Aug.23/60	3.6	11	12,000
		May 27/63	2.0	6.0	212

TOWNSHIP OF HUNTLEY

I GENERAL

This is a predominantly rural municipality with a population of 1,813 which appears to be relatively static.

II WATER SUPPLY

In all areas of Huntley Township, water supplies are obtained from dug and drilled wells. Some springs occur in the township and are used for cattle-watering purposes. In Carp there are two dug wells that serve as community wells for those people without their own wells. Samples collected from these community wells in 1960 had a high bacterial count. It is reported that several of the private dug wells in the community are also contaminated, probably due to poor well construction or the close proximity of septic tanks to the wells. Two other dug wells supply small trailer parks. Near Carp and in Concessions V and VI west of Carp, some of the drilled wells yield sulphurous water.

At the Carp Airport a 42 gpm well was used to supply the distribution system. This well has been abandoned because the Department of Transport no longer operates this airport and the present owners have no use for the distribution system. Two high capacity wells supply water for the Department of National Defence installation at Carp. Both these wells produce water from a sand and gravel aquifer at a depth of about 100 feet. Some domestic drilled wells produce water from gravel in the Carp Valley west of Carp.

III WATER REQUIREMENTS FOR THE FUTURE

Ground water should continue to fill the needs of the residents of the area for the future. The residents of Carp would benefit by the installation of a central water distribution system.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private methods of sewage disposal are in general use throughout this township.

The Department of National Defence has constructed a small(one-acre) sewage lagoon near the community of Carp to treat the sanitary waste flows from the Emergency Measures Organization Centre. The effluent from this sewage lagoon discharges to the Carp River(sample point number C.17.3T).

2. Industrial Waste Disposal

Industrial activity in this municipality is minimal in extent.

3. Surface Water Quality

The pertinent laboratory results indicate that the quality of the Carp River water is satisfactory as the river enters Huntley Township(sample point number C.22.7). At the next sample point(number C.19.8) which is located 2.9 miles downstream at Highway 17, a high coliform content was revealed. The laboratory results pertaining to samples obtained from the Emergency Measures Organization Centre lagoon outfall indicate that the degree of treatment provided by this waste stabilization pond is somewhat less than normally is expected of this type of treatment unit. The high 5-day BOD content of 33 ppm. in the lagoon effluent results in an unsatisfactory 5-day BOD content of 11 ppm. in the receiving stream subsequent to initial dilution. At sample point number C.14.4 where the Carp River flows out of Huntley Township, normal stream quality was evident according to the results of analyses which were performed on the water samples obtained.

Satisfactory conditions were indicated in the water samples obtained from Cody Creek, a tributary of the Mississippi River, at sample point number MC.12.1.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that ground water be used for future water-supply requirements. Consideration should be given to the establishment of a communal water distribution system for the Carp area using ground water as the source of supply. Until an adequate water supply is available to the community, the extent and cause of any existing well contamination should be determined. Dug wells should be properly capped and the ground surface should be sloped away from them to prevent the entry of surface drainage. In cases where the well construction is not at fault and bacterial contamination is present, well owners should chlorinate drinking water supplies before use.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

The treatment efficiency of the sewage lagoon which serves the Emergency Measures Organization Centre near Carp should be reviewed.

Efforts should be continued to prevent the discharging of untreated or inadequately treated sewage flows to watercourses within the municipality.

TOWNSHIP OF HUNTLEY

Analyses of Stream and S.T.P. Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
CARP RIVER					
C.14.4	Carp River at Fitzroy-Huntley Boundary	May 28/63	1.9	8	64
C.17.2	Carp River downstream from E.M.O. lagoon outfall	May 27/63	11	Susp.solids- 10	770
C.17.3T	E.M.O. lagoon outfall	May 27/63	33	Susp.solids- 80	8,100
C.18.2	Carp River at Hwy.17 downstream from Carp	Aug.25/60	2.4	9	40,000
		May 28/63	--	--	--
C.19.8	Carp River at bridge S.E. of Carp - near C.N.R.	Aug.25/60	2.3	9	450
		May 28/63	2.1	2.6	17,500
C.22.7	Carp River at Huntley-March Boundary	May 29/63	1.5	Susp.solids- 6	90
MISSISSIPPI RIVER					
MC.12.1	Cody Creek at Panmure side road	Aug.24/60	2.4	21	830
		May 28/63	1.5	10	2,200

TOWNSHIP OF MARCH

I GENERAL

The population of this predominantly rural municipality has increased from 678 in 1953 to 910 in 1963, a growth of approximately 34 per cent.

A large development has been proposed for the southern and eastern part of the township.

II WATER SUPPLY

All residents of March Township obtain water supplies from dug and drilled wells. The drilled wells are estimated to make up about 90 per cent of the total number. They have an average depth of about 70 feet and most are reported to produce adequate supplies of potable water from the bedrock. Deep wells into the Ottawa formation in Concessions VI and VII encounter sulphurous or salty water. Flowing wells are common in the southern part of the township.

III WATER REQUIREMENTS FOR THE FUTURE

A large development is contemplated for the south-eastern part of the township and ground water supplies have been proposed to serve the increased population. It appears likely that adequate supplies of ground water will be available to meet the domestic and subdivision requirements for the township. The Nepean sandstone formation and the March and Oxford formations are the most favourable sources for such supplies where they are not overlain by the Ottawa formation.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private methods of sewage disposal are employed throughout the township, with new systems being installed under the supervision of the Gloucester-Nepean Health Unit staff.

The proposed development for the southern and eastern sections of the municipality would likely be served by a communal sewerage system with sewage flows being conducted to the Nepean Township water pollution control plant. Any sewage works for this section of March Township should be a joint project with the Townships of Nepean and Goulbourn.

2. Industrial Waste Disposal

Industrial activity has not become important in this predominantly rural township.

3. Surface Water Quality

The sanitary chemical and bacteriological qualities of the waters of the Carp River and Stittsville Creek within this municipality were satisfactory.

The upstream section of Watts Creek was sampled at the Nepean-March boundary(sample point number W.4.3). According to the results of the laboratory analyses which were performed, the quality of the creek water at this location was satisfactory during the recent period of sampling. Adverse quality had been indicated during the sampling program in 1960.

The water samples collected from Constance Creek at one sample point(CO.4.7) within this municipality indicated satisfactory stream quality in this section of the creek.

Similar satisfactory conditions were revealed in the Ottawa River at the Torbolton-March boundary(sample point number O.146.7).

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that, if any concentrated growth is anticipated for the township, a program of test drilling be undertaken in the areas under consideration to determine whether or not ground water can adequately supply the developments. Deep drilling into the Ottawa limestone formation is not recommended.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Any sewage works proposed for the south-eastern portion of the municipality should be a joint project with the Townships of Nepean and Goulbourn.

TOWNSHIP OF MARCH

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	CARP RIVER				
C.22.7	Carp River at Huntley-March Boundary	May 29/63	1.5	Susp.solids - 6	90
CS.27.3	Stittsville Creek at Hwy.15	May 29/63	1.7	Susp.solids - 5	420
C.27.5	Carp River at Hwy.15	May 29/63	2.4	Susp.solids - 9	120
	WATTS CREEK				
W.4.3	Watts Creek at Nepean-March Boundary	Aug.25/60 May 29/63	9.0 1.8	Susp.solids-204 Susp.solids- 26	19,000 1,100
	SHIRLEYS BROOK				
S.0.1	Shirleys Brook near mouth		--	--	--
	CONSTANCE CREEK				
CO.4.7	Constance Creek at Torbolton-March Boundary	May 29/63	1.3	Susp.solids- 2	62
	OTTAWA RIVER				
O.146.7	Ottawa River at Torbolton-March Boundary				
	A - Ontario side	July 25/62 May 29/63	- 1.5	- Susp.solids- 3	42 40
	B - Quebec side	May 31/63	1.6	40	30

TOWNSHIP OF MARLBOROUGH

I GENERAL

The population of this predominantly rural municipality in 1963 approximates 795.

II WATER SUPPLY

The sources of water supply in the township are dug and drilled wells. It is estimated that about 50 per cent of the wells are dug and that these generally are not adequate sources of supply during the summer months. The drilled wells have an average depth of about 100 feet and are considered to be dependable sources of supply. All drilled wells produce water from the limestone bedrock.

Two wells having a total capacity of 120 gpm supply the Industrial Farm near Burritt's Rapids. Nine wells are used for public supply at the Department of Lands and Forests Park on the south side of Highway 16 north of Kemptville. Some of the Lands and Forests wells yield sulphurous water and have indicated bacterial contamination.

The Green Valley Cheese Factory of the Kemptville Dairy, located in Lot 5, Concession I, obtains water for processing, cooling, and equipment washing from a privately-owned drilled well.

III WATER REQUIREMENTS FOR THE FUTURE

The population of Marlborough Township appears to be static at the present time and no marked population increase is anticipated. Future water needs are not likely to increase appreciably and ground water will continue to supply the domestic needs of the township.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private sewage disposal systems are employed.

The Rideau Industrial Farm is a reform institution which is located at Burritt's Rapids in the south-western corner of the township. An extended aeration type sewage treatment plant receives the sewage flows from this institution. The chlorinated effluent is discharged to a small watercourse and thence to the Rideau River.

2. Industrial Waste Disposal

The Green Valley Cheese Factory discharges industrial wastes exclusive of whey to the Rideau River. This outfall was not accessible for sampling on May 27, 1963.

3. Surface Water Quality

The appended laboratory results reveal a high coliform content in the sample(R.43.9) obtained from the Rideau River at the upstream limit of the county on May 27, 1963. At other stream sampling points within the township, surface water quality generally was satisfactory.

The high coliform content revealed in the sample obtained from the Rideau Industrial Farm S.T.P. outfall during the recent sampling program indicates the need for more effective effluent chlorination practices at this institution.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

Because the overburden materials over most of the township are not suitable for obtaining adequate supplies of water from dug wells, it is recommended that drilled wells be constructed to supply most water requirements.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Close supervision of effluent chlorination procedures is necessary at the Rideau Industrial Farm S.T.P.

Untreated industrial waste flows from the Green Valley Cheese Factory should be excluded from the Rideau River.

TOWNSHIP OF MARLBOROUGH

Analyses of Stream and S.T.P. Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	RIDEAU RIVER				
R.34.1	Rideau River at Becketts Landing Bridge(Hwy.16)	Nov.1/61	2.1	2.3	0
		Aug.27/62	-	-	59,000
		May 27/63	1.9	2.0	116
R.34.2I	Green Valley Cheese Factory outfall- not accessible for sampling				
R.41.8	Rideau River at Burritts Rapids dam	May 27/63	1.9	2.6	12
RB.42.4	Brassils Creek at mouth	Aug.23/60	1.7	5	100
		May 27/63	1.7	1.1	112
R.43.4T	Rideau Industrial Farm S.T.P. outfall	May 27/63	2.9	Susp.solids- 18	40,000
R.43.9	Rideau River at upstream limit of Carleton County	May 27/63	1.9	2.3	26,000

TOWNSHIP OF NEPEAN

I GENERAL

The phenomenal population increase from 4,055 in 1953 to 26,026 in 1963 indicates the extent of urban development which has occurred in this municipality during the past decade. The proximity of this township to the City of Ottawa has resulted in the rapid development of those areas lying adjacent to the capital.

The Police Village of City View is situated in the north-eastern part of Nepean and lies adjacent to the City of Ottawa.

II WATER SUPPLY

Nearly all residents of Nepean Township obtain water supplies from dug and drilled wells. A few subdivisions bordering the City of Ottawa are supplied with city water.

The majority of the wells are drilled and some flowing wells are reported in the north-western part of the township. Good supplies of water are generally obtained from the Nepean sandstone formation and the sandstones and limestones of the March, Oxford, and Rockcliffe formations. Some excellent high capacity wells are developed in the sand and gravel formations at Crystal Bay.

The Township of Nepean operates several water distribution systems in the township which rely on ground water as their source of supply. The communities of Lynwood Village, Manordale Heights, Parkwood Hills, Meadowlands, Crestview, Lakeview, Crystal Bay, and parts of City View, are serviced by the municipal systems. Other subdivision developments are serviced by private drilled wells. Some of the municipal systems have had water shortages during periods of peak demand. The township is endeavouring to alleviate this situation and achieve flexibility of supply and maintenance by the drilling of additional wells and the uniting of several individual systems.

The Connaught Rifle Range, the Defence Research Board (Shirley Bay), Carleton Lodge, and the Northern Electric Company Limited are all supplied by individual drilled wells. All supplies are reported to be adequate.

In the rural areas of the township, wells drilled into the bedrock usually produce adequate supplies of water for domestic requirements.

III WATER REQUIREMENTS FOR THE FUTURE

If the estimated population for Nepean Township is realized, it will be necessary to provide a large population with an adequate water supply. The township is able to supply its present water needs, but with an expanded population water from the City of Ottawa will probably be needed to supplement the available ground water supplies. As the future water requirements are different for different parts of the township, the discussion below is on the basis of a division into three sections; namely, an inner urban area between the Ottawa city limits and the inner limit of the Green Belt, the Green Belt area, and the area beyond the Green Belt. These areas have been defined by the National Capital Commission.

The increase in population will probably be greatest in the inner urban area. Throughout most of this area enough ground water likely could be found to meet the demand. Due to the possibility that, with time and the heavy demand, the ground water supplies might be depleted or reduced significantly, it may be advantageous to supply parts of the area with city water if it can be made available.

In the Green Belt area, it appears likely that ground water supplies will be able to meet most of the demand; however, adequate control of water-taking will be necessary to ensure beneficial use and sound production practices.

The Township of Nepean has made arrangements to supply the proposed Department of Mines and Technical Surveys location near Bells Corners from a newly constructed municipal well. Private well supplies have been found to supply the Federal Department of Agriculture at the Animal Research Institute and the Animal Diseases Institute in the township.

In the areas beyond the Green Belt, ground water supplies will probably be adequate for the foreseeable needs.

Potential aquifers in the township are overburden sands and gravels, the Nepean sandstone, and the Rockcliffe, Oxford, and March formations.

IV WATER POLLUTION

1. Sanitary Waste Disposal

The installation of private sewage disposal systems is supervised by officials of the Gloucester-Nepean Health Unit staff. Malfunctioning septic tank systems have been reported in the past in areas where soils are unsatisfactory for this purpose, and in low-lying sections.

The Nepean Township Water Pollution Control Plant is located within the Green Belt and west of the City of Ottawa. This plant receives sewage flows from northern sections of the municipality and eventually may serve housing developments in adjacent townships. The final effluent from this secondary type plant is chlorinated on a seasonal basis and is discharged to Watts Creek approximately two miles upstream from the Ottawa River.

This activated sludge plant was designed for an average dry weather flow of 1.5 million gallons per day and a maximum flow of 1.88 million gallons per day. During 1962 the average daily flow was 1.9 million gallons and the maximum recorded daily flow was 3.7 million gallons. The hydraulic overloading of the plant is attributed, at least in part, to the high degree of infiltration to the sewer system. A program of storm sewer installation is in progress to alleviate this condition. Emergency storm water pumping from a sewer in the City View area has resulted in the pollution of the small receiving stream which discharges to the Rideau River and was sampled at mileage point number RME.8.6.

It is obvious that expansion of treatment facilities at the Nepean Township W.P.C.P. is necessary.

The Connaught Rifle Range is situated in the north-western corner of the township. Sewage disposal is effected by a septic tank with the chlorinated effluent discharging to a drainage ditch and thence to Watts Creek. The outfall was not located for sampling during this survey.

The Carleton County Home for the Aged(Carleton Lodge) is served by an extended aeration sewage treatment plant located on the west side of the Rideau River approximately 15 miles south of the Ottawa River. The plant was designed for a daily flow of 12,500 gallons. The chlorinated effluent is discharged to the Rideau River.

2. Industrial Waste Disposal

Industrial plants which might be expected to have an objectionable quality of waste are connected to the municipal sanitary sewer system.

3. Surface Water Quality

The water samples collected from the Ottawa River at ranges 0.140.0 and 0.140.5 located downstream and upstream from the mouth of Watts Creek,respectively, varied little either in 5-day BOD, turbidity, or coliform content. It is thus indicated that the presence of treated and partially treated sewage flows in the waters of Watts Creek was not exerting adverse effects on the quality of the Ottawa River water. However, only one set of samples has been obtained from the Ottawa River at these locations. Future sampling will assist in the assessment of these conditions.

With a few exceptions, the sanitary chemical and bacteriological qualities of the Rideau River were generally satisfactory in that section of the watercourse which forms the eastern boundary of the Township of Nepean. Coliform contents in excess of OWRC objectives were revealed at sample points R.11.0E and R.13.1 which are located respectively at the Black Rapids locks(east side), and in the river immediately downstream from the mouth of Mosquito Creek. It is significant to note that the waters of Mosquito Creek, when sampled at the creek mouth in Gloucester Township, displayed a satisfactory quality.

The small watercourse which receives flows pumped on an emergency basis from a sewer in the City View area was sampled at Highway 16(sample point number RME.8.6) immediately upstream from the creek's discharge to the Rideau River. The following pertinent laboratory results reveal the adverse quality of these flows:

Sample Point No.	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
RME.8.6	13	6.5	227,000

The laboratory results pertaining to samples obtained from the Carleton Lodge S.T.P. outfall on May 29, 1963, are reported as follows:

Sample Point No.	5-Day BOD (in ppm.)	Suspended Solids (in ppm.)	Total Coliform Count per 100 ml.
R.15.0T	7.2	17	24,700

The coliform content revealed in this sewage treatment plant outfall is high for an installation where effluent chlorination is practised. The outfall sewer extends into the Rideau River.

The east branch of Pinecrest Creek, when sampled at the northern limit of the township(sample point number PE.2.4), contained a 5-day BOD content of 11 ppm. and a coliform content of 12,800 per 100 ml. These laboratory results suggest the presence of sanitary waste.

The analyses of water samples collected from Graham Creek indicated satisfactory conditions therein.

A high coliform content was revealed in the water sample obtained from Stillwater Creek at the township road 0.4 miles upstream from the creek mouth.

The waters of Watts Creek were of satisfactory quality upstream from the Nepean Township W.P.C.P. outfall. Although this plant is hydraulically overloaded, the 5-day BOD content of the effluent was satisfactory at the time of sampling on May 28, 1963. Effluent chlorination procedures had been commenced for the season on May 15. High 5-day BOD contents were revealed in the creek at the other sample points located downstream from the W.P.C.P. Partially treated sewage flows from the Connaught Rifle Range discharge to the creek in this downstream section of the watercourse.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that ground water be developed to its full extent in the three areas discussed previously. To make this possible all parties concerned with the development of ground water in the township should be aware of the Ontario Water Resources Commission water permit legislation which is designed to lead to full, beneficial use of all water resources.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

The planning of sewage works in the western portion of the township should be undertaken in conjunction with plans for the adjacent sections of March and Goulbourn Townships.

The construction of an adequate outfall sewer to the main channel of the Ottawa River should accompany any expansion program at the Nepean Township W.P.C.P. Increased treatment facilities at this plant are necessary. The storm sewer construction program should proceed in order to eliminate the necessity for pumping untreated sewage flows to surface waters.

Effective effluent chlorination procedures should be maintained at the Carleton Lodge S.T.P.

Continued supervision is necessary to ensure that untreated or inadequately treated waste flows will be excluded from all watercourses within the township.

POLICE VILLAGE OF CITY VIEW

This police village is situated in the north-eastern corner of the Township of Nepean and adjacent to the City of Ottawa. The 1963 population is 4,447.

Water is obtained on a communal basis from ground water sources.

Problems have occurred in the past from the use of subsurface sewage disposal systems in this area where fissured bedrock lies close to the ground surface.

TOWNSHIP OF NEPEAN

Analyses of Stream and Sewage Works Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
OTTAWA RIVER					
0.140.0	Ottawa River downstream from mouth of Watts Creek				
	A - at Ontario shore	May 31/63	1.8	3.1	24
	B - 1/4 distance across river	May 31/63	1.6	2.1	68
	C - 1/2 distance across river	May 31/63	1.2	5.5	500
	D - 3/4 distance across river	May 31/63	1.4	5.0	54
0.140.5	Ottawa River upstream from mouth of Watts Creek				
	A - 1/4 distance across river	May 31/63	1.4	3.1	12
	B - 1/2 distance across river	May 31/63	0.8	3.5	10
	C - 3/4 distance across river	May 31/63	1.8	2.6	12
RIDEAU RIVER					
RME.8.6	Creek from Merivale area at Hwy.16	May 29/63	13	6.5	227,000
R.11.0W	Rideau River at Black Rapids Locks- west side	Aug.11/60	0.7	2.0	70
		Nov.3/61	2.8	2.6	16
		May 29/63	1.4	3.1	30

TOWNSHIP OF NEPEAN

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
RIDEAU RIVER - cont.					
R.11.0E	Rideau River at Black Rapids Locks - east side	Aug.11/60	2.0	3.0	30
		Nov.2/61	2.8	2.0	44
		May 29/63	1.5	3.1	11,000
R.13.1	Rideau River below mouth of Mosquito Creek	May 29/63	1.7	2.6	23,000
R.13.3	Rideau River upstream from mouth of Mosquito Creek	May 29/63	1.6	4	130
R.14.9	Rideau River downstream from Carleton Lodge S.T.P. outfall	May 29/63	1.5	4	240
R.15.0T	Carleton Lodge S.T.P. outfall	May 29/63	7.2	Susp.solids- 17	24,700
R.15.1	Rideau River upstream from Carleton Lodge S.T.P. outfall	May 29/63	1.6	4	190
RJ.15.5	Jock River at Hwy.16	Nov.2/61	2.9	2.3	21
		May 29/63	1.1	1.8	134
RJ.20.8	Jock River at Con.Rd.4- Twp. of Nepean	Nov.2/61	3.1	2.0	26
		May 29/63	1.6	2.0	238
RJ.25.7	Jock River at Nepean-Goulbourn Boundary	Aug.18/60	2.3	2.0	170
		Nov.2/61	2.5	3.8	66
		May 28/63	1.5	2.3	620
RM.17.7	Mud Creek at Hwy.16	May 29/63	2.1	2.3	82

TOWNSHIP OF NEPEAN

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	PINECREST CREEK				
PW.2.4	West branch at city limit	NOT EXPOSED FOR SAMPLING			
PE.2.4	East branch at city limit	Aug.25/60	2.4	Susp.solids-46	780
		May 28/63	11.0	8.5	12,800
	GRAHAM CREEK				
H.0.1	Graham Creek at Hwy.17	Aug.25/60	1.2	17	1,900
		May 28/63	2.0	5.0	1,100
H.1.7	Graham Creek at Base Line	Aug.25/60	1.7	15	400
		May 28/63	1.9	3.6	126
	STILLWATER CREEK				
ST.0.4	Stillwater Creek at twp.road	Aug.25/60	4.0	38	500
		May 28/63	1.6	3.5	8,700
STE.1.8	East branch at C.N.R.crossing	May 28/63	1.5	2.6	182
STE.2.4	East branch at Base Line Rd. (Hwy.15 at Bells Corners)	May 28/63	1.2	1.5	2,200

TOWNSHIP OF NEPEAN

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	WATTS CREEK				
W.0.1	Watts Creek at mouth	May 31/63	8.8	3.1	140
W.0.3	Watts Creek at Shirleys Bay Rd.	Aug.25/60	2.2	13	80
		Nov.7/61	7.6	3.5	0
W.1.8	Watts Creek at Hwy.17	Aug.25/60	35	Susp.solids-50	166,000
		May 27/63	14	8.0	630
W.2.0	Watts Creek downstream from Nepean Twp. W.P.C.P. outfall	May 28/63	7.2	10	June 11/63 - 10
W.2.1.T	Nepean Twp. W.P.C.P. outfall to creek	May 28/63	8.4	27	---
W.2.2	Watts Creek upstream from Nepean Twp. W.P.C.P. outfall	May 28/63	1.8	4.5	June 11/63 - 158
W.4.3	Watts Creek at Nepean-March Boundary	Aug.25/60	9.0	Susp.solids-204	19,000
		May 29/63	1.8	Susp.solids- 26	1,100

TOWNSHIP OF OSGOODE

I GENERAL

The population of this municipality has increased from 3,808 in 1953 to 5,739 in 1963. There are three police villages within the township, i.e. - Kenmore, Metcalfe and Osgoode. A portion of the Police Village of Manotick is located in Osgoode Township.

II WATER SUPPLY

The sources of water supply for Osgoode Township are dug, drilled, and driven wells. A few flowing wells and springs are also used as sources of supply. Although the majority of the wells are drilled into the limestone bedrock, some wells produce water from the overburden at scattered locations throughout the township and along the Rideau River.

Dug wells are reported to be inadequate during summer periods.

Drilled wells are reported to be adequate sources of supply. Some cases of salty and sulphurous water are reported in drilled wells in the south-eastern section of the township. Water supplies at the Police Villages of Metcalfe and Kenmore are obtained from privately-owned, dug and drilled wells. In both cases drilled wells with an average depth of 60 feet provide the best supply. The Springhill Meteor Observation Station on Highway 31 obtains water from a 300 gpm drilled well. The water is treated for hardness, iron, and hydrogen sulphide.

A drilled well in Lot 1, Concession II, supplies sixteen trailer homes.

Driven sandpoint wells are used to obtain an adequate water supply for domestic and fire-fighting purposes at Osgoode Station. This community is situated on a sand plain near the south-western corner of the township.

III WATER REQUIREMENTS FOR THE FUTURE

The present population is scattered about the township with small concentrations at Metcalfe, Kenmore, and Osgoode Station. Some development is taking place along the Rideau River and on Long Island near Manotick. It appears likely that ground water will provide sufficient supplies for domestic and municipal systems. Although the overburden in some parts of the township may yield considerable quantities of water, the limestone bedrock will likely be the most commonly used aquifer. It may be difficult to obtain potable supplies of ground water in the north-eastern corner of the township north-east of the Gloucester Fault.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private sewage disposal systems are employed throughout the township.

2. Industrial Waste Disposal

Cochrane's Dairy is located in Concession II, Lot 25, and discharges industrial wastes to the south branch of the Castor River. The sample obtained at the outfall (NRS.56.1I) indicates the need either for adequate treatment or for another method of disposal.

3. Surface Water Quality

The laboratory results of water samples collected from the Rideau River along the western border of Osgoode Township indicate that the sanitary chemical and bacteriological qualities of this section of the watercourse were satisfactory at the time of sampling.

Similar conditions were revealed in those tributaries of the South Nation River which drain part of Osgoode Township. Two outfalls to this river system were of concern in this survey. The industrial waste discharge(NRS.56.1I) from Cochrane's Dairy to the South Castor River had excessive 5-day BOD and coliform contents. Although located in the Township of Gloucester, the H.M.C.S. Gloucester S.T.P. discharges its sewage effluent to a ditch which extends to a tributary of the North Castor River within the Township of Osgoode. The laboratory results of the water sample obtained at the outlet of the ditch(NR.63.1T) reveal a 5-day BOD content which was high, considering the fact that the treated wastes were being diluted by surface run-off flows.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that any developments or areas contemplating the use of high capacity wells should undertake ground water surveys and test drilling to determine the amount and quality of ground water available.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

Industrial waste disposal procedures at Cochrane's Dairy should be revised in order to exclude these untreated flows from the South Castor River.

The treatment efficiency of the H.M.C.S. Gloucester S.T.P. should be reviewed to ensure that the effluent flows will be adequately stabilized prior to discharge to the Castor River system.

The Police Village of Manotick and the adjacent areas of Osgoode Township should be considered in the proposal to provide sanitary sewers in the Manotick area with a connection to the proposed sewage treatment plant which would be located on the Rideau River.

POLICE VILLAGE OF KENMORE

The 1963 population of this community is 155.

Water is obtained from ground water supplies which appear to be adequate for future requirements.

Private sewage disposal facilities are employed.

POLICE VILLAGE OF METCALFE

The reported population of this police village is 373.

Water supplies are obtained from dug and drilled wells.

Private sewage disposal systems are utilized.

POLICE VILLAGE OF OSGOODE

The present population of this police village is 690.

The location of this community on a sand plain enables the population to obtain water supplies from driven sand point wells.

Sewage disposal is effected on individual premises.

TOWNSHIP OF OSGOODE

Analyses of Stream and Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
RIDEAU RIVER					
RE.17.8	Rideau River at Manotick Bridge E. channel	Aug.22/60	1.3	4.0	20
		Nov.2/61	2.2	2.3	28
		Aug.27/62	-	-	170
		May 29/63	1.5	2.3	
RW.18.2	Rideau R. at Manotick Bridge W. channel	Aug.22/60	1.9	4.0	600
		Nov.3/61	2.2	2.3	6
		Aug.27/62	-	-	430
		May 29/63	2.1	2.3	98
R.23.7	Rideau R. at new Kars bridge	Nov.1/61	1.9	1.8	2
		Aug.27/62	-	-	110
		May 27/63	3.5	1.8	2

TOWNSHIP OF OSGOODE

Analyses of Stream and Outfall Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	SOUTH NATION RIVER				
NR.56.1	Castor River at Carleton-Russell Boundary	May 27/63	1.7	2.5	74
NRS.56.1	S.Castor River at Carleton-Russell Boundary	May 27/63	1.8	3.5	46
NRS.56.1I	Cochrane's Dairy outfall	May 27/63	160	Susp.solids-79	11,700,000
NRS.57.1	South Castor River at side road one mile N.E. of Kenmore	Sept.7/60 May 27/63	1.6 1.8	2 6	310 24
NRS.65.2	South Castor River at Hwy.31 S. of Vernon	Sept.7/60 May 27/63	4.4 2.2	11 6.5	520 120
NRM.58.4	Middle Castor R. at Con.Rd.9	Sept.7/60 May 27/63	1.2 1.7	2 3.5	250 34
NRM.64.6	Middle Castor R. at Hwy.31	Sept.7/60 May 27/63	3.6 2.2	Susp.solids-138 3.6	4,000 14
NR.57.0	Castor R. at side road 0.25 miles N. of junction with Middle Castor River	Sept.7/60 May 27/63	1.3 2.5	2 4.5	810 38
NR.61.6	Castor River at Con.Rd. 8	Sept.7/60 May 27/63	1.6 2.3	5 5	840 78
NR.63.1T	H.M.C.S.Gloucester S.T.P. outfall to Castor River(plant located in Twp.of Gloucester)	May 27/63	21	16	800

TOWNSHIP OF TORBOLTON

I GENERAL

This township with a population in 1963 of 724 is predominantly rural except for summer residential development along the Ottawa River. In 1962 it was reported that the number of summer residences might approximate 1,100, and that the summer population might approximate 4,500. The most concentrated area of development is Buckham Bay East, the Sand Hills, and Constance Bay West.

II WATER SUPPLY

The water supply for Torbolton Township is obtained from dug, drilled, and driven wells. The dug wells are not always adequate sources of supply. All of the drilled wells except a few that obtain water from overburden deposits north of Dunrobin, produce water from the bedrock. Some of the drilled wells in Concessions III, V, and VII produce a salty water from the bedrock. Driven sandpoint wells are common in the areas of cottage development along the Ottawa River. The drilled and driven wells are generally adequate sources of supply.

The Woodlawn Cheese Factory, situated in Lot 2, Concession IV, is supplied with water for cooling and equipment-washing purposes from a drilled well.

III WATER REQUIREMENTS FOR THE FUTURE

The summer population of the township is increasing as new cottages are built along the Ottawa River. In these areas water needs will increase but the demand can likely be met by ground water supplies.

IV WATER POLLUTION

1. Sanitary Waste Disposal

Private sewage disposal systems presently are utilized. If concentrated residential development should continue, consideration should be given to the development of both communal sewage works and water supplies. An exception to the necessity for communal sewage works would be the development of multi-row summer residences in sandy areas where a communal water supply was available.

2. Industrial Waste Disposal

The Woodlawn Cheese Factory is located in Concession IV, Lot 2. Industrial wastes are discharged to a septic tank and thence to a ditch. On May 29, 1963, it was evident that this waste tends to pond near the plant and does not gain access to a watercourse.

3. Surface Water Quality

The laboratory results indicate that the sanitary chemical and bacteriological qualities of the Ottawa River water were satisfactory in that section of the watercourse which borders Torbolton Township.

Similar conditions were revealed in the water samples collected from Constance Creek within the municipality.

V RECOMMENDATIONS FOR WATER DEVELOPMENT

It is recommended that deep drilling for water supplies into the Ottawa formation generally be avoided because of the risk of encountering salty water. Adequate supplies of potable water will likely be obtained locally from the overburden and from the Rockcliffe, Oxford, and Nepean formations.

VI RECOMMENDATIONS FOR POLLUTION CONTROL

The protection of surface water quality along the township's extensive beaches is necessary. If it should become apparent in areas of concentrated residential development that adequate private sewage disposal facilities cannot be provided, consideration should be given to the installation of communal sewage works. Sewage treatment could be effected by a waste stabilization lagoon.

TOWNSHIP OF TORBOLTON

Analyses of Stream Samples

Sample Point No.	Location	Date of Sample	5-Day BOD (in ppm.)	Turbidity in Silica Units	Total Coliform Count per 100 ml.
	OTTAWA RIVER				
0.146.7	Ottawa River at Torbolton-March boundary				
	A - Ontario side	July 25/62	--	--	42
		May 29/63	1.5	Susp.solids - 3	40
	B - Quebec side	May 31/63	1.6	40	30
0.153.2	Ottawa River at Constance Bay Beach	May 29/63	1.9	Susp.solids - 6	60
0.160.6	Ottawa River at Moore Landing-Quyon Ferry(upstream from township limit)				
	A - 1/3 of distance across river	May 29/63	1.4	Susp.solids - 4	96
	B - 2/3 of distance across river	May 29/63	1.3	Susp.solids - 9	290
	CONSTANCE CREEK				
CO.0.1	Constance Creek near mouth	--	--	--	--
CO.3.0	Constance Creek at road 3 miles south-east of Woodlawn	May 29/63	0.9	Susp.solids - 6	210
CO.4.7	Constance Creek at Torbolton-March boundary	May 29/63	1.3	Susp.solids - 2	62

APPENDIX A

INTERPRETATION OF ANALYSES

The analyses employed to assess the quality of surface water during this survey were: biochemical oxygen demand (BOD), suspended solids or turbidity, and the total coliform determination.

The BOD of sewage, industrial wastes or polluted waters, is the oxygen required during stabilization of the decomposable organic matter or chemical material by aerobic biochemical action.

Suspended solids are reported in parts per million and indicate the measure of undissolved solids of organic or inorganic nature. Where suspended solids values approach 20 parts per million or less, laboratory difficulties are experienced and result in the values being determined as turbidity which is reported in silica units.

The total coliform count is employed to obtain an enumeration of coliform organisms, and the number is reported per 100 millilitres. The membrane filter technique was employed.

Additional specific analyses are performed, when necessary, to evaluate other aspects of water quality. Several surface water samples were obtained for the evaluation of phenol or phenolic equivalents. It should be noted that whereas the term phenol is used, the laboratory results actually are reported in phenolic equivalent units.

Unless otherwise indicated, all analyses except pH are reported in parts per million.

APPENDIX B

SURFACE WATER QUALITY OBJECTIVES

The OWRC objectives for surface water quality in the Province of Ontario are as follows:

5-day BOD - not greater than 4 ppm.

Total coliform count- not greater than 2,400 organisms per 100 ml.

Phenolic equivalents- average concentration of 2 ppb. and a maximum concentration of 5 ppb.

pH - Range of 6.7-8.5